Buyer be smart: How to shop for IT products with your users. Leadership Series follows page 32

Who's liable for year 2000 work? Experts say read the fine print in service contracts. Corporate Strategies, page 37

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Spam attacks send angry firms to court

By Stewart Deck and Matt Hamblen

INTERNET SPAM is no longer a joke to angry businesses. They increasingly are fighting back with civil and criminal lawsuits and offering rewards for information leading to arrests. In some cases, users are even trying chargeback tactics.

Driving the get-tough attitude is mounting frustration over crippled and lost business because of overloaded electronic-mail servers, trademark infringement and the nefarious combination of return address impersonation — known as spoofing — and blasts of spamming E-mail advertisements. Faced in some instances with death threats, exasperated and angry World Wide Web site administrators are trying anything and everything — including offering bounties for the names of spammers — and risking online vendettas in the process.

IMAGE AT STAKE

Particularly vulnerable to spamming — which some observers call "Internet terrorism" — is a company's image, which businesses spend untold dollars building, maintaining and protecting.

One high-profile example is Samsung America, Inc.'s nightmare, which began July 19 when a fake advertisement blasted across the Internet to millions of electronic mailboxes. The angry replies caught Samsung by surprise — it hadn't sent out the advertisement.

Other messages bearing Samsung's return address have swamped unsuspecting mailboxes since then, including a

Spam, page 16

JAMES YANG

By Thomas Hoffman Before **college graduate** Stephanie Devaney, 21, entered the **information technology** workforce two months ago, she narrowed her target list to IT **vendors and consulting firms.** There were no banks, retailers or other user companies in her sights.

Her decision in June to sign on with Big Six consulting firm Ernst & Young LLP in Atlanta is a symptom of a **growing problem** for corporate IT shops:

IT workforce, page 14

Mega-warehouse drives targeted marketing

By Jaikumar Vijayan

IF YOU THINK building a data warehouse for one company is hard, try building an integrated version for more than 10.

That's what HFS, Inc. in Parsipanny, N.J., is trying to do.

The $10 billion holding company of national chains said it is nearing completion on a $5.5 million integrated warehouse that contains data on more than 50 million customers across all of HFS's brands worldwide. Those companies include Avis, Inc., Howard Johnson International, Inc., Ramada International Hotels & Resorts, Century 21 Real Estate Corp., Coldwell Banker Corp. and Resort Condominiums International.

Mega-warehouse, page 115

HFS's Scott Anderson: The idea is to reward customers

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SPECIAL REPORT

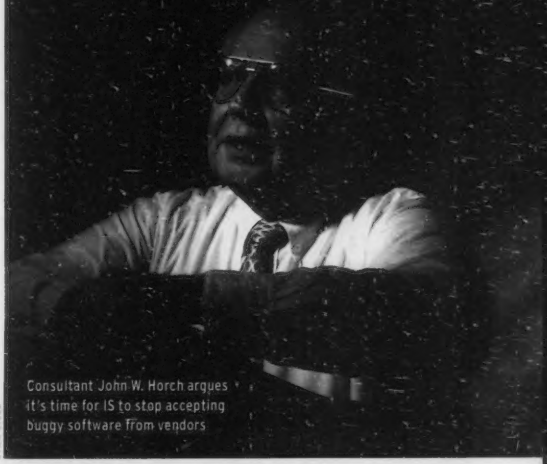
Software Quality

Defect-free software is like flossing after every meal. Everyone agrees it's the right thing to do, but few have the discipline to really do it.

For example, two-thirds of corporate IS shops don't have a formal software quality process. Yet the business costs of buggy code include rework, billing errors, customer dissatisfaction, lost revenue and more calls to the help desk.

So *Computerworld* offers a six-step plan for software quality, career advice and resources galore to get you started down the quality track.

Our special report begins on page 77.



LYNN KILLER

Consultant John W. Horch argues it's time for IS to stop accepting buggy software from vendors

INSIDE THIS ISSUE

SKILLS SHORTAGE STRIKES AGAIN
Systems integrators pass on higher costs to users. Page 2

CHRYSLER'S CAD CAR
Automaker saves 8 months, $80 million using homegrown tools. Page 4

First Y2K suit
Michigan grocery store sues vendor over faulty software. Page 6

MAINFRAME MAVEN
Gene Amdahl, 74, works on a new super-cool processor. Pages 12, 30

UP FRONT

Crash!

It was ironic that my PC crashed as we were preparing our Special Report on software quality, which begins on page 77. The culprit appeared to be a shareware utility I downloaded from the Internet that altered the Windows registry, a critical file that's about as easy to decipher as Middle English. We'll never know; the hard disk had to be reformatted.

Users like me are IS nightmares because we can't resist the urge to have the latest, greatest stuff on our machines. Our PCs are digital petri dishes, full of shareware, bug fixes, "push" receivers, games and utilities.

Sound familiar? I suspect the same scenario is being played out all across the country. The Internet has changed the face of software quality — maybe not for the better.

Not too long ago, vendors took excruciating care to make sure the software they released was reasonably bug-free.

Now, of course, the Internet has become a giant disk drive full of bug fixes, slipstream patches and point revisions. If you're supporting Netscape Navigator and Internet Explorer, I'll bet there are 10 different patched and revised versions of those products at your company.

Is the Internet a friend or foe of software quality?

The Internet has been a godsend for vendors and users, who no longer have to wait months to get fixes for problem code. But it can also be a crutch. Vendors are more likely to put a not-quite-debugged product on the market, knowing that fixing it is just a posting away. Heck, many vendors now test their products in public months before they're released.

Is the Internet a friend or foe of software quality? Drop me a line with your opinion at the address below.

Paul Gillin, *Editor*
Internet: *paul_gillin@cw.com*

THE FIFTH WAVE
BY RICH TENNANT

E-mail Rich Tennant at thewave@iac.net

Integration inflation

▸ *Users balk at soaring programmer salaries*

By Jaikumar Vijayan

NO MORE blank checks.

That's the message fed-up users are sending to systems integrators as the skills shortage, combined with rising salaries, has blown the lids off outsourcing budgets everywhere.

When Trigon Blue Cross/Blue Shield outsourced its year 2000 conversion work to Cap Gemini America last year, it made sure to build in one condition to the fixed-price contract: that the insurer wouldn't end up bearing the brunt of inflating programmer salaries.

That simple clause could help the company save as much as 5% to 10% in additional labor costs by the end of the multimillion-dollar project.

Such savvy negotiations will become increasingly important for companies in the coming months.

During the past year alone, salaries for programmers and other computer professionals jumped by more than 17%, and the number of unfilled computing positions stood at 190,000, according to Information Technology Association of America, an industry trade group in Arlington, Va.

"Our position going in was to incent our vendor to hire the most reasonably priced people they could get for the project," said Dan Clark, director of application services at Trigon in Richmond, Va.

"We did not want them to think they had a blank check to go out and hire people at whatever rate the market will bear," Clark said.

TOP DOLLAR

There is cause for such concern. Systems integrators today are paying significantly more than what they had originally budgeted to attract, hire and retain top talent. Especially in hot new areas such as SAP or Baan implementations, for example, integrators are sometimes paying up to 50% more than budgeted to find or replace talent, analysts said. And year 2000 conversion jobs have further increased the skills demand.

Typically, information systems staffing firms and integration companies have been able to lure the best talent in a skills-starved market by paying well above what corporations can afford to pay. For instance, many IS staffing firms pay workers as much as a 30% premium above what they could earn as an IS employee [CW, May 19]. Those costs are passed on to the customer.

KATHRIN MILLER

Parker Hannifin's David Krauthamer works with systems integrators to fix the salaries paid to programmers on projects

"The salaries we have to pay for our programmers have been increasing at nearly double the rate compared to even two years ago," said Paul Cosgrave, chairman and CEO of Claremont Technology Group, an integrator in Portland, Ore. "But so far, we have had little push back from our customers when we pass it on to them."

That's because customers looking to outsource may have little choice given the realities of today's market where demand far outstrips supply. "Frankly, this is becoming a seller's market," Cosgrave said.

"After all, what are you going to do?" asked David Krauthamer, MIS manager at Parker Hannifin Corp. in Rohnert Park, Calif. "It is not like you are going to be able to stop a multimillion-dollar project halfway because you are faced with a resources issue."

As a result, users may be better off trying to manage costs by enforcing commitments from their vendors relating to quality of the deliverables and the time frame in which work gets done, said Howard Lackow, an analyst at Technology and Business Integrators in Woodcliff Lake, N.J.

Parker Hannifin regularly farms out application development projects to integrators and contractors.

For low-end projects, the firm used to budget $1 to $1.50 for labor costs for every $1 it spent on application software. Today, the cost for labor is closer to $4 for every $1 spent on the software — and the cost is climbing sharply, Krauthamer said.

To control costs, his company recently started working with its integrators to not only recruit programmers, but also to fix their salaries. □

Sound Off
Join us for an online forum on software quality — what works and what doesn't? Walter Crosby, *Computerworld*'s vice president of information services, hosts.
www.computerworld.com

Audio interview: Managing
Line managers now control more than half of IT spending. Dale Kutnick, CEO of Meta Group, Inc., discusses the implications for IS.
www.computerworld.com/cbc

Check out our year 2000 Resources Page: stories, research and tips from your fellow managers.

Find out more online @COMPUTERWORLD

A bug found in the top three Web browsers is raising concern about Java security. Here's where users can find more information:

Creative Concepts
www.creativecorp.com

Mesander's explanation page
http://neurosis.hungry.com/ben/msie_bug/

Microsoft's Internet Explorer page
www.microsoft.com/ie/security/

Browser bug opens firewall

By Stewart Deck and Sharon Gaudin

A SECURITY FLAW that has popped up in the three leading browsers enables Java applets to open certain types of network connections to any host on the Internet.

When the loophole occurs, browsers from Sun Microsystems, Inc., Microsoft Corp. and Netscape Communications Corp. don't implement the Java security specification properly. That allows an applet to send the visitor to another server and from there, to load image or class files onto the visitor's hard drive.

"Bugs like this make me nervous," said Patrick Connolly, vice president of the Internet finance group at Neural Applications Corp. in San Francisco. "Say we build a really cool applet and send it out. All those people can come back at me and get into my servers. That's major scary, man.

"It's definitely a worry," Connolly said. "It makes you stop and think what people can get into. It hasn't been a problem for us yet, though."

FOUND PROBLEM

The problem occurs with the way Java Development Kits (JDK) are implemented in the browsers, said Ben Mesander, a consultant at Creative Concepts Corp. in Boulder, Colo., who discovered the problem.

Mesander said although Microsoft, Netscape and Sun haven't publicly showed much concern, he is "uncomfortable with anything that can get a covert channel through a firewall."

He said security architects from the vendors have quietly contacted him. Mesander found that image files and class files could be easily redirected.

Mesander said the redirecting feature could let an applet creep inside a firewall and collect statistics or other reports that were stored as image files. It also could ferret out class files with information such as database names, host names and field names.

SLIPPING THROUGH

"The problem is definitely in the implementation," said Michael Bernard, Microsoft's product manager for Internet Explorer, which has about 15 million users. "No one subverted security or anything. When developers write code, things can slip through."

Bernard said Microsoft expects to have a patch for Windows 3.1 users by this week and for Windows 95 and NT users soon after. He said the fix will be included in the upcoming version of Internet Explorer 4.0.

"It's important to distinguish between JDK problems and implementation problems," said Eric Chu, JavaSoft's product manager for the JDK. "We are working with Microsoft to clear this up." □

A small fraction of software jobs is devoted to quality. Page 90

County, IBM settle outsourcing

▸ N.Y. officials reach compromise on pact

By Thomas Hoffman

WESTCHESTER COUNTY, N.Y., officials and a labor union have settled their dispute over an IBM outsourcing contract that has been a political football.

The compromise, reached earlier this month, settles several lawsuits filed over the $85 million contract. It lets IBM keep the contract until the end of the year and lets 19 displaced information systems employees return to work next month.

Whether IBM retains the contract longer will depend on 1998 budget decisions, said county board member George Lattimer. He called the settlement a compromise to keep the county's IS services "from going down the drain."

The case illustrates the labor and political problems that government organizations face with outsourcing operations to the private sector. Privatization is expected to be an issue in the county's elections this fall.

Westchester County Executive Andrew O'Rourke awarded a seven-year information technology outsourcing contract to IBM in January [CW, Jan. 27]. Most of the county's 100-plus IS employees were offered jobs with IBM. But some weren't, and some opted to fight the move.

After the employees' union filed a legal complaint, a New York state judge ruled that O'Rourke lacked the authority to create or eliminate jobs in the county government. The judge said the county's charter grants that authority only to the county Board of Legislators.

TOM HOFFMAN

Westchester County's Luigi Martino says "there are no guarantees for '98"

PROBLEMS REMAIN

Several parties agreed the settlement is a short-term fix that still leaves much uncertainty.

"Nobody's happy; nobody wins," said Luigi Martino, a 23-year systems analyst who helped lead an employee fight against privatization. "I see myself [employed] for four months, but there are no guarantees for '98," he said. □

Java kit to challenge speed of C++

By Sharon Gaudin
CUPERTINO, CALIF.

SUN MICROSYSTEMS, INC. is gearing up to take on the legion of critics who complain that Java is too slow and weak for building mission-critical business applications.

The next version of Sun's Java Development Kit, which developers use to build Java applications, is slated to improve the speed of relatively slow Java applications by 50%.

Sun officials claimed that would make Java almost as fast as development powerhouse C++.

The upgraded kit — which also is expected to have security improvements — will come out at year's end, Sun officials told *Computerworld* last week.

"That's great," said Patrick Connolly, vice president of the Internet Finance Group at Neural Applications Corp. in San Francisco. "Any time increased speed is involved, that's great for the developers and for the people hanging around waiting for their applications to run."

The speed boost will come from the addition of a "just in time" compiler to Sun's Java virtual machine, said Eric Chu, the Java Development Kit product manager at Sun's JavaSoft division.

The speedy compiler was purchased from tools developer Symantec Corp., Chu said.

He said developers will also be able to customize their security.

"That would be great for us," said Tripp Johnson, manager of new technologies at First Tennessee National Corp. in Memphis. "It's important to be able to make certain restrictions for different kinds of applets and applets from different people or companies. If you have any doors just a little open, some hacker is going to find it."

AND THERE'S MORE

Sun officials disclosed several other technology enhancements that are on the way:

- Version 1.1 of Sun's Java Browser is slated for release next month. The lightweight browser, designed for network computers or consumers, is being reworked so it can use JavaBeans, which are reusable chunks of Java-based software.
- InfoBus, software that connects components so they can exchange information, is expected to come out this month, perhaps as soon as this week. The technology is being codeveloped with Lotus Development Corp. □

Sun cuts prices on mid-range Unix servers. Page 67

OMG shuffle

The Object Management Group (OMG) is losing its best-known evangelist.

The transition is important because the OMG, based in Framingham, Mass., is the standards body for object-oriented software and the chief advocate of the Common Object Request Broker Architecture.

CEO Chris Stone is leaving for a job as senior vice president of strategy at Novell, Inc.

The OMG board is expected to promote Bill Hoffman from vice president of business development to chief operating officer and Richard Soley from vice president and technology director to chief technology officer. — Sharon Gaudin

Frank Brooks beat a deadline for his data warehouse, then found much of the data was useless. Data Warehousing, page 71

Boise Cascade's Laura Longcore says her company saves 45 cents on every item it sells on the Web. The Internet, page 43

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ETC.

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Visual tools key to Chrysler cost-cutting

By Thomas Hoffman

ADVANCED, HOMEGROWN visualization software helped Chrysler Corp. slash eight months and $80 million from the development of its next-generation LH family of large cars, compared with its first-generation LH models in 1992.

The computer-designed 1998 LH models, including the Dodge Intrepid and Chrysler Concorde, will roll out to showrooms this fall.

This is the first time the Auburn Hills, Mich., automaker has developed a full family of cars exclusively by using computers, said Michael Crawford, an executive for advanced vehicle engineering at Chrysler.

The $2.1 billion LH development effort took 31 months; the first-generation LH models required 39 months.

COMPETITIVE EDGE

Chrysler's cutting-edge use of technology to develop its LH models "has put it further ahead of the [other] Detroit boys," said Gisela Wilson, an analyst at Advanced Manufacturing Research, Inc. in Boston.

Getting manufacturing and engineering teams to work together while they are designing cars "can avoid an awful lot of delays," Wilson said.

Chrysler has used IBM's Catia computer-aided design software to help it build cars since 1989. But it was Chrysler's homegrown Data Visualizer, a Unix-based tool written three years ago in C++, that helped the automaker's engineers visualize the cars as they were being developed and resolve design issues almost immediately.

Car development, Crawford said, "is a massive jumble unless you're in synch on data visualization and mock-up."

For example, before using the visual software, it took Chrysler three weeks to "mate" a car assembly with a chassis on a 1993 LH model because of a wide variety of interference points that had to be resolved, said Art Anderson, manager of advanced vehicle engineering at Chrysler.

Using the visual tools, Chrysler engineers could review design proposals and identify all interference points between assembly and chassis within 15 minutes, Anderson said.

"The big thing with the visualization tool is that there's no ambiguity about [engineering work that's] being done," Anderson said. Once an engineer makes an electronic design modification, the changes are automatically sent to every one of the large-car division's 750 engineers via electronic mail.

Data Visualizer also helps Chrysler synchronize engineering with manufacturing more effectively. As recently as a few years ago, it was common for Chrysler to have physical mock-ups that were two months behind the latest engineering designs, Crawford said. "One hand didn't know what the other was doing," he said.

Now Chrysler requires all of its suppliers to use the system "so that we're all on the same page," Crawford said.

He said he was unsure how much Chrysler spent to develop the visualization software. □

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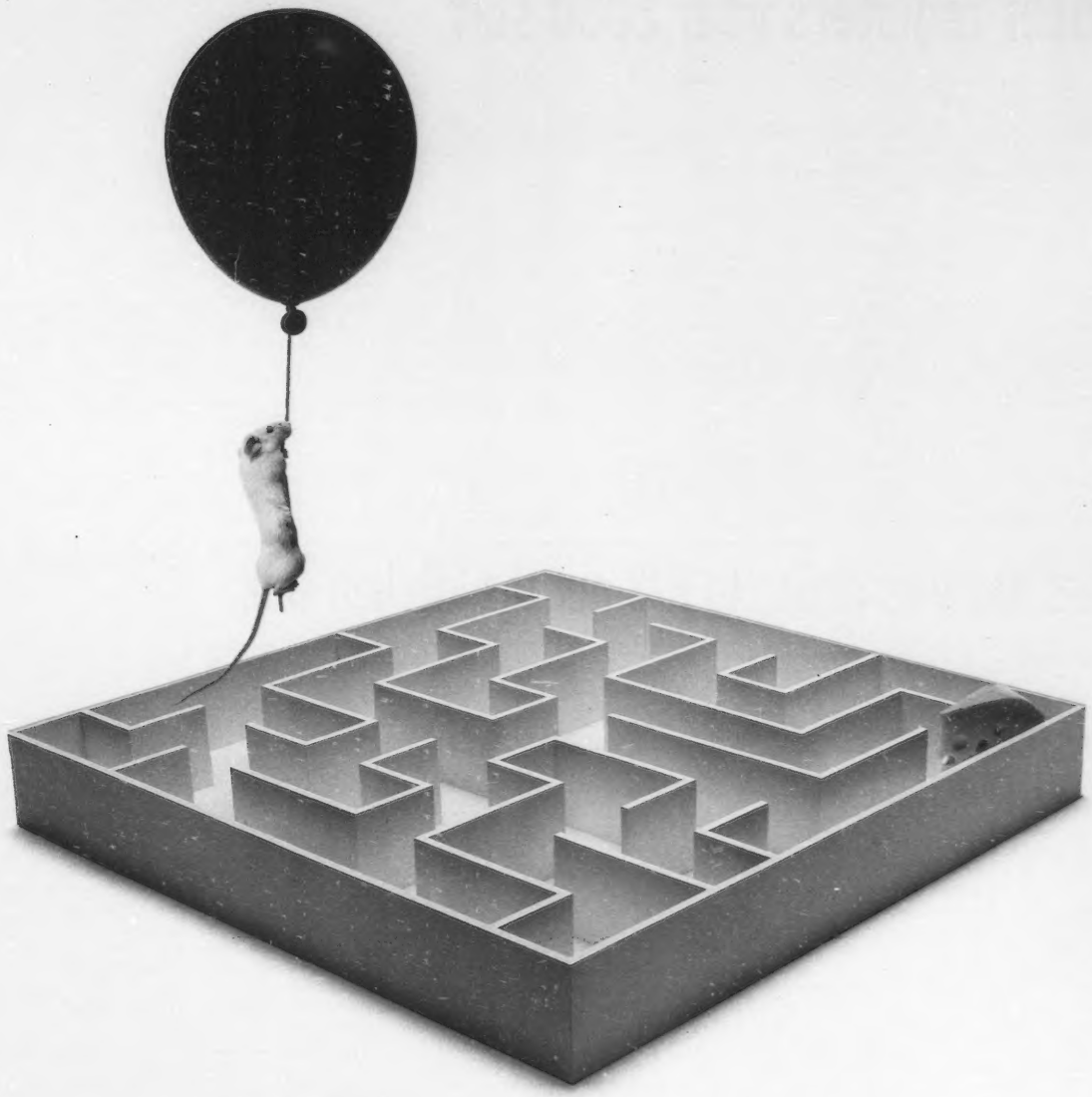

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Grocer registers year 2000 suit

▸ *Believed to be the first of its kind — but not the last*

By Wylie Wong

A MICHIGAN produce store has filed what is believed to be the first year 2000-related lawsuit, because its cash registers freeze when customers use credit cards with year 2000 expiration dates.

Produce Palace International in Warren, Mich., recently sued Tec-America Corp. in Atlanta and local service vendor All American Cash Register, Inc. in Inkster, Mich., claiming the companies sold a defective computer system they knew they couldn't fix.

The lawsuit asks for about $100,000 in damages for the cost of the system and tens of thousands of dollars for lost business.

The Produce Palace suit features two particularly interesting issues, said attorney Dean Morehous Jr. at law firm Thelen Marrin Johnson & Bridges in San Francisco. "It involves relatively recent hardware and software, and that debunks the myth that the year 2000 problem applies only to legacy and mainframe systems," he said.

YEAR 2000

"The other is there's an allegation that there was a misrepresentation [about] whether the system could be made year 2000-compliant. That's a serious claim to make, and other vendors may have to deal with those types of claims," Morehous said.

The suit debunks one other myth, said William Ulrich, president of Tactical Strategy Group, Inc. in Soquel, Calif. "Most people assume when the lawsuits start flying it's the Fortune 500 company suing the big systems integrators or other Fortune 500 companies," he said.

In the Michigan suit, the store owners claim that their computer, installed in 1995, has crashed more than 100 times, rendering 10 cash registers useless during the crashes, said Brian Parker, attorney for Produce Palace.

"Someone fills the cart up, comes to the cash register and finds their card is rejected, and they're embarrassed and angry," Parker said. "[The store owners] lose the customers for the rest of their business life."

Tec-America officials didn't return telephone calls. All American Cash Register officials declined comment on the case, but said they are still working on a fix. In the meantime, store owners Mark Yasike and Sam Katz are now processing year 2000 credit cards by hand.

That could amount to a lot of cards. Credit-card companies and banks have exacerbated the year 2000 problem by issuing cards with year 2000 expiration dates. Visa U.S.A., Inc. stopped producing them last year when businesses had trouble processing them, analysts said.

MasterCard International, Inc. warned member banks not to release those cards, but some have ignored the warnings. About 40,000 people, less than 1% of MasterCard's 400 million cardholders, currently have cards that expire in the year 2000, said MasterCard spokesman Ed Dixon.

Visa and MasterCard are testing to make sure card readers are year 2000-compliant. About 98% of the 13 million businesses that accept MasterCards are compliant, Dixon said.

LAWSUIT MANIA

As the year 2000 creeps closer, analysts said beleaguered businesses and angry stockholders will bombard the courts with more lawsuits. Morehous predicts those lawsuits will total about $1 trillion.

Stephanie Moore, an analyst at Giga Information Group in Cambridge, Mass., predicts the suits will come from two camps: businesses that claim the product they purchased is defective; and shareholders, who in the face of lowered profits sue company executive boards because they didn't solve the year 2000 problem.

The Michigan suit is a wake-up call to corporate America, Ulrich said. "Businesspeople don't seem to be able to fathom the seriousness of a problem until it turns into a real liability. And a lawsuit is a real liability," he said.

Moore's advice for information systems managers is to fix their computer systems first and litigate later. She also recommends that businesses write letters to every hardware and software vendor they work with to say they expect the products to be year 2000-complaint and expect the vendor to pay for the costs. Otherwise, she said, you waive your right to future litigation. □

Users link everything to R/3 but the kitchen sink

By Randy Weston

SOME COMPANIES are starting to use SAP AG's R/3 as the centerpiece of their corporate computing systems, hooking non-R/3 applications into the framework of the R/3 client/server suite.

"What this is doing is making SAP both an application function vendor as well as an infrastructure vendor," said Joshua Greenbaum, an analyst at Hurwitz Group, Inc. in Newton, Mass. "What [users] are doing is not necessarily pure R/3 anymore. Usually there is an R/3 element, but you can have things that are not R/3 that use the same data and the structure."

Elf Atochem North America, Inc., a $2 billion, Philadelphia-based chemical manufacturer, has completed about 75% of its R/3 installation and already has plans to link non-R/3 health, environment and safety, plant control and document management applications to R/3's human resources, financial and manufacturing process control modules.

"You don't care if you are in one software system or not. What you care about is the ability to get information when you want it and where you want it and in the form you want to see it," said Robert Rubin, vice president and chief technology officer at Elf Atochem. "Having centralized data in R/3 — and the investment that you have in SAP's system, it's just attractive to consider SAP as the means to do that."

R/3 users heading to SAP's user group conference next week in Orlando, Fla., will see vendors demonstrate everything from fax software to plant operation control software that was designed specifically to link to R/3.

And SAP is helping, too, with interfaces designed to make it easier to connect other vendors' software to its product. But users will still need to do some work themselves, such as building interfaces to legacy systems that may not already have R/3-ready interfaces.

Greenbaum warned that users risk the loss of flexibility if they adopt an R/3-centric approach. "For users, it's nice to have someone take care of this for them and make good on all this connectivity. On the other hand, everything you use has to be compliant with the R/3 vision of how things are done."

That was a price GATX Capital Corp. was willing to pay. The $5 billion financial services company will wrap up its big R/3 installation by year's end. The San Francisco firm is so determined to keep as much as possible of its business processes contained in R/3 that it is willing to build functionality — not provided in the SAP package — into R/3.

"What we've done is taken leasing transactions, which are nothing more than compound sets of other basic financial transactions, and put them together in a complex way," said Chief Financial Officer Michael E. Cromar.

Although he wouldn't reveal the cost of the project, Cromar said it still costs less than having to build from scratch. He also said tying in third-party packages to handle the work wasn't something his company wanted to push on users.

"Multiple interfaces intimidate users even as they get more sophisticated using the system," he said. "They are a pain. There are companies that work in computers and those that work with computers. We are the latter. While [information technology] is important here, we don't want it to be everything." □

Top tasks for post-R/3 implementation:

- Choose key users to continue exploring new functionality
- Tie peripheral software systems to R/3
- Prepare for upgrades by determining what new functions are necessary

COMPUTERWORLD

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1997 Buyers Guide Enterprise Resource Planning *http://lionhrtpub.com/apics/BG/BGPLERP.html*

Should You Buy Maintenance Management From Your ERP Vendor? *www.advmfg.com/execs/exec0297m.html*

Corrections

A story in the Systems Integrator supplement [CW, July 28] misconstrued Digital Equipment Corp.'s status in hardware and software maintenance. Digital has outsourced contract administration, not actual hardware and software maintenance, to Electronic Data Systems Corp.

Also, a chart on page S4 of that supplement incorrectly cited Unisys Corp.'s 1996 revenue. The correct figure is $6.4 billion.

Also, customer references by rank on page S19 are incorrect for every integrator other than EDS, Digital and IBM. Visit @Computerworld (*computerworld.com/si*) for the correct information. The rankings by revenue only include those integrators whose customer satisfaction was measured.

And lastly, KPMG Peat Marwick Chief Technology Officer Allan Frank left the firm earlier this year to join AnswerThink Consulting Group. His replacement is Tom Richards.

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FRANKLY SPEAKING

The high cost of thrash

FRANK HAYES

THE ACADEMICS are looking for that missing productivity again.

This time it's the University of California at Irvine that will spend $643,637 of your tax dollars trying to figure out why, after investing trillions in information technology over the past couple decades, the productivity of U.S. businesses is still flat.

Actually, that isn't a bad price for a three-year study that will cover 200 U.S. companies along with data from 50 countries.

But here's a tip for the researchers: Instead of searching for places where IT productivity is created, try hunting for the holes where it drips away.

Maybe, just maybe, the trouble is the high cost of thrash.

Got Windows NT? Did it replace Windows 95? Did you have every version of Windows 3.x before that? Have you upgraded your word processors and spreadsheets regularly? How about your Web browsers? And your development tools — Visual Basic and PowerBuilder and whatever Web-page editor you're using this week?

That's thrash — the unending cycle of upgrades that keeps software vendors swimming in profits and corporate users drowning in unproductive labor.

Think about it: How much time did IS spend on those upgrades? How much user work time was lost during installation? How much time was lost during training — whether it was in a classroom or users just trying to figure out how the new software works?

How much extra time and money did you spend because the upgraded software didn't play nicely with other applications, requiring more upgrades, workarounds or fixes?

How many customers walked away because a clerk couldn't work the new system or a customer service agent got backed up on calls or a salesman couldn't reach data he needed to close a deal?

That's the cost of thrash. And oddly enough, lots of IS shops have figured out the problem without any academic studies.

They've figured out a solution, too: Slash software upgrades to the bare minimum required to get the job done.

Two years ago, 80% of corporate sites predicted that most of their users would be running Windows 95 by now. But only 13% of corporate desktops were actually running Windows 95 as of this spring, according to a survey by Forrester Research in Cambridge, Mass.

Apparently, somebody decided not to upgrade after all.

No Windows 95 means no Office 95 or Office 97 upgrades. No 32-bit application upgrades at all, in fact. No beta-of-the-month for Web browsers. No rush to grab new versions of development tools.

Those users running "obsolete" software are still processing words, juggling spreadsheets, browsing Web sites and getting their work done. They're just doing a bit more of it, because they don't lose so much time to thrash.

How much are low-thrash shops saving? Maybe the Irvine researchers can find out, but a conservative guess is that for every dollar you don't pay for an upgrade package, you'll save at least $10 in installation, training and support costs.

Of course, not everyone's happy that productivity is up and upgrades are down. Some users really miss having the latest toys. And those upgrades-not-taken are taking their toll on software vendor revenue — even Microsoft is warning that its money machine is downshifting from overdrive.

If vendors want that business back, they'd better start cranking out upgrades that are worth a lot more than the cost — easier, IS-friendlier and less frequent.

Otherwise, they're out of luck. Because smart IS shops are taking out the thrash. And there's nothing academic about that. □

Hayes is Computerworld*'s staff columnist. His Internet address is frank_hayes@cw.com.*

SHORTS

Microsoft joins smart-card race

Microsoft Corp. announced it will distribute a Smart Card Software Development Kit with application programming interfaces for developers who want to write smart-card applications for Windows-based machines. Microsoft's announcement came on the heels of Visa International, Inc.'s unveiling of plans to use Java-based smart cards with technology from Sun Microsystems, Inc. [CW, Aug. 4].

Fidelity emphasizes Web

Mutual fund giant Fidelity Investments is using the twin carrots of deeper discounts and customized services to entice customers onto the World Wide Web. For the past several months, Boston-based Fidelity has provided deep discounts to customers who conduct Internet-based trades, said George G. Hathaway III, a Fidelity vice president. Speaking at Internet Expo last week, Hathaway said Fidelity plans to give clients Web-based access to account data, including tools to analyze prospective investments and retirement scenarios.

Bell Atlantic/Nynex deal is done

Bell Atlantic Corp. and Nynex Corp. are now one, following last week's approval of the merger by the Federal Communications Commission. The $25.6 billion deal was first announced in April 1996. New York-based Bell Atlantic, as the company will be called, will serve 40 million telephone access lines and 5.5 million wireless customers in 19 and Washington.

Hackers put 'net mail in a BIND

Security holes in some Internet domain-name software have let hackers hijack data being sent across the Internet, the Computer Emergency Response Team at Carnegie Mellon University said. The problem involves vulnerabilities in the Berkeley Internet Name Daemon (BIND), which allows Internet addresses to be represented by words instead of numbers. The problem has been fixed in new releases of the software. BIND runs on a wide range of Unix platforms, including those from IBM, Hewlett-Packard Co. and Sun. An advisory is posted at *ftp://info.cert.org/pub/cert_advisories/CA-97.22.bind.*

Software distribution pushed

Microsoft and Marimba, Inc. in Palo Alto, Calif., have proposed the Open Software Description (OSD) format, which they hope to make an industry standard used in software distribution over the Internet and intranets. The OSD specification, for use in push technologies, aims to provide a standard format for describing software components, their underlying structure and their relationships to other components, according to Microsoft. The specification has been endorsed by vendors such as Lotus Development Corp. and Netscape Communications Corp.

Oracle's Sedona effort dies

Oracle Corp.'s object-oriented programming environment, code-named Sedona, is officially dead after the company decided it wouldn't produce zero-administration thin clients. Following an intensive investigation of the project that was launched three years ago, Oracle decided to pull the plug, Oracle officials said. Oracle had put the Sedona project on hold several weeks ago. Elements of Sedona will be included in the Developer 2000 and Designer 2000 tools.

Aberdeen: Netscape star fading

Netscape is losing its ability to influence Fortune 1,000 companies, according to a report by Aberdeen Group, Inc. Once the undisputed star of the Internet world, Netscape is relying on vendor partners such as IBM and Sun to sell products to large companies, Boston-based Aberdeen said. Netscape's SuiteSpot, which includes electronic-mail and directory servers, makes the Mountain View, Calif., company a competitor to its partners and hurts Netscape, Aberdeen said. Netscape rejected the findings, saying that its sales staff recently won business at 200 information systems shops.

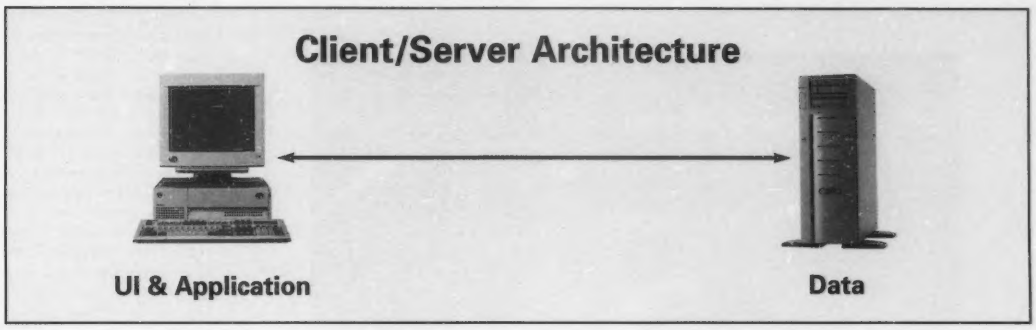
Feds called on Web ad rejection

Web-based telephone directory publisher Switchboard, Inc. is asking federal officials to investigate agreements among Netscape, Yahoo, Inc. and the five regional Bell operating companies (RBOC) for potential antitrust violations. Officials at Switchboard in Westboro, Mass., said Netscape recently rejected Switchboard ads because of an exclusive advertising agreement between Yahoo and the RBOCs on Netscape's Web site.

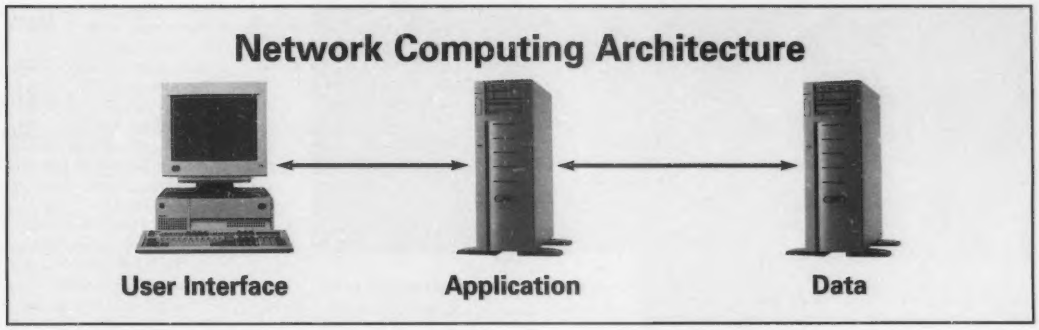
SHORT TAKES **IBM** today announces its high-end AS/400 RISC systems, due to market early next year [CW, Jan. 20], along with a revamped, electronic-commerce-centric marketing focus of the tried-and-true AS/400 using existing tools.... **Visa U.S.A., Inc.** officials said consumers won't be liable for any charges on stolen credit cards, including credit cards stolen over the Internet, if they report the theft to their bank within 48 hours. ... **Tandem Computers, Inc.** unveiled a $15,000 Windows NT packaged cluster, based on Microsoft's Wolfpack clustering software, that ties together two independent servers in a single cabinet. ... In October, **Northeast Utilities Service Co.** will begin a service that will let its 1.2 million customers in Massachusetts and Connecticut view and pay their electric bills over the Web. ... **Computer Associates International, Inc.** began shipping data integrity packages for Microsoft Internet Information Server and Exchange Mail Server. ... **EMC Corp.** in Hopkinton, Mass., is shipping an option to its EMC Data Manager departmental tape backup system that lets Oracle database users attach the backup directly to EMC's high-end Symmetrix disk systems. Prices start at $280,000.

Get your Enterprise Applications off the Desktop and onto a Server where they belong.

Client/Server architecture places the user interface and application software on the desktop, and the data on the server computer. Unfortunately, managing enterprise applications on desktop PCs is an administrative nightmare.



Moving your applications to servers is the essence of Network Computing Architecture. Server-based applications can dramatically lower administrative costs while improving application performance, reliability and security.



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Apple user groups try to stay informed, keep members

By Kim Girard

SEVERAL Apple Computer, Inc. user groups across the country last week said they are struggling to stay informed so they can continue to advise members after the chaos of the past several months.

"We're in a wait-and-see mode," said John Saling, secretary and treasurer of the Wichita Falls Area Mac Users Group in Texas. "Everyone's wondering what to buy. You don't know what to do. Everybody's totally confused."

"I would not be surprised by now if we started to lose a few [Apple] user groups," said Nathan Nuttall, an analyst at Sherwood Research, Inc. in Wellesley, Mass.

In some areas, the fallout from Apple's downward spiral has been severe.

For example, the relatively small 63-member Mid-Cities Macintosh and Newton Users Group in Texas is on the verge of closing. Apple Corps in Dallas has seen its membership dip from 1,000 to about 600 this year.

The Portland Macintosh Users Group membership has declined from 1,300 to 1,000 members over the past several years, president Charles Devore said. Devore blames Apple's marketing rather than its internal corporate turmoil and financial problems for the decline.

"When Apple doesn't do good advertising, new people don't buy Apple computers," Devore said.

Some smaller groups are falling away because of a lack of volunteer support and disenchantment with Apple's politics.

But Chris Kilbourn, president of the 80-member Apple Network Managers Association chapter in Seattle, said some user group problems sound like sour grapes. "It's the same people who were booing Bill Gates at Macworld," he said, referring to the users who were angry that Apple accepted a $150 million investment from Microsoft Corp. [CW, Aug. 11]. "People don't understand that Apple is a business. It's not our brother, our sister or our religious savior."

But it is the business aspect that has some users saying they are concerned about Apple's long-term prognosis. Others said they don't believe Apple co-founder Steve Jobs has been forthcoming about the Microsoft deal, including details about how much Microsoft paid for Apple's intellectual property. They also questioned Jobs' faith in the company following confirmation that he sold 1.5 million shares of Apple stock June 26, just days before former Chairman and CEO Gilbert F. Amelio was ousted.

"I would not be surprised by now if we started to lose a few [Apple] user groups."
– Nathan Nuttall, Sherwood Research

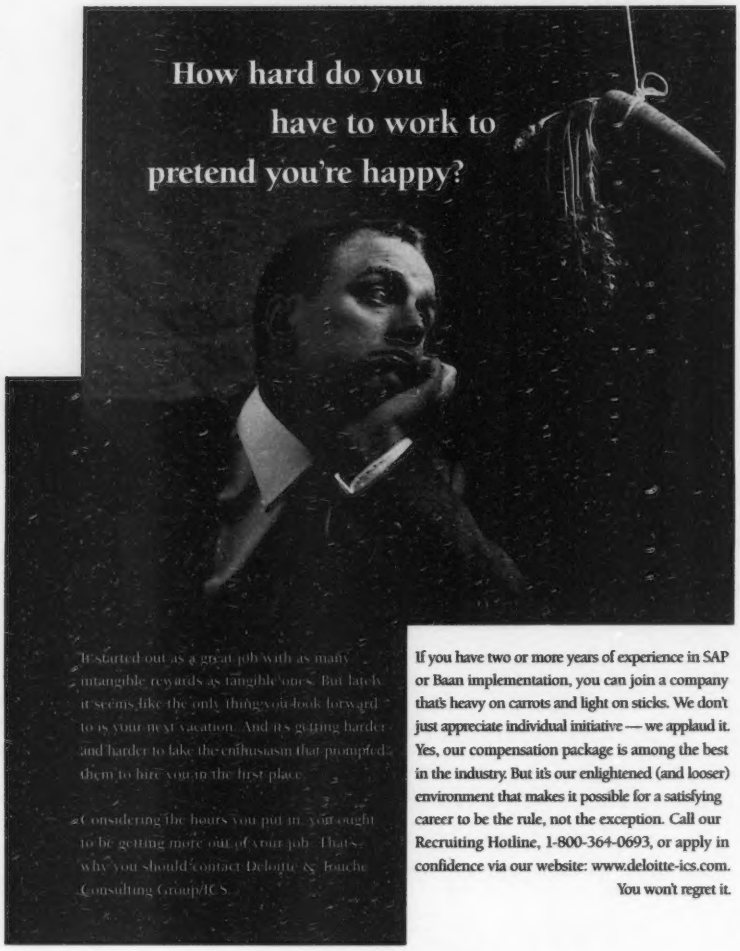
"If he knew Amelio was out the door [when he sold the stock], then I am really worried," said Ann Wrixon, executive director of the influential 12,000-member Berkeley Mac Users Group in Berkeley, Calif. "That means he doesn't think he can turn it around."

Jobs, meanwhile, continued a fiscal crackdown last week. He eliminated the company's sabbaticals and downgraded employee severance packages. He also established new stock options to help boost morale. The changes came amid Apple's announcement that it won't be profitable in the fourth fiscal quarter, ending next month. Sales also aren't expected to rebound until next year.

Still, several user group representatives said wild Apple stock fluctuations in recent weeks don't faze them.

"The stock will take care of itself if Apple straightens things out," said Richard Meyeroff, a former board member and an instructor of the New York Mac Users Group.

Meyeroff said the 4,000- to 5,000-member group is climbing back from a low point last year when it almost shut down because of management problems. □



Oracle8 Database Messaging

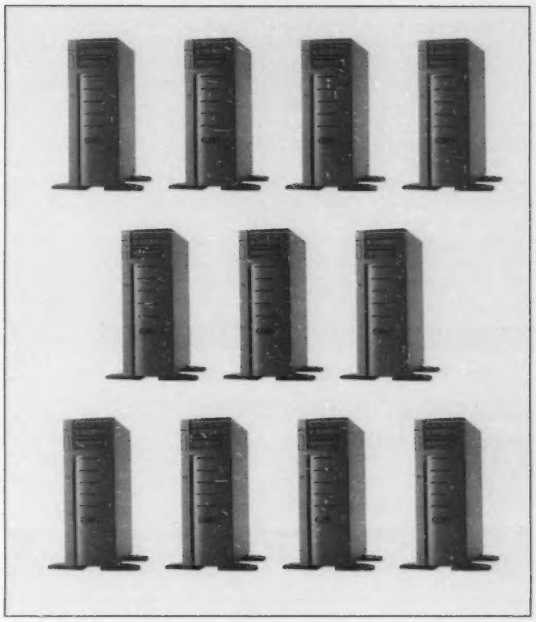
vs

Microsoft Exchange Email

2,500 Oracle InterOffice Users on 1 NT Server

Database Messaging: 10-times more users than Microsoft

2,500 Microsoft Exchange Users on 11 NT Servers*



Data from Microsoft funded Zona Research study

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*Based on average number of Microsoft Exchange users per server in Microsoft Exchange vs Lotus Notes: A Cost of Ownership Study, Zona Research Inc., Fall 1996. All other company and product names are the trademarks of their respective owners.

Mad for mainframes

▸ *Big iron pioneer Gene Amdahl to offer super-cooled CMOS processor*

By Tim Ouellette
ATLANTA

MAINFRAMES ARE cooler than ever. And if Gene Amdahl comes through on his promise, they'll get downright freezing by next year.

Amdahl's new company, Commercial Data Servers, Inc. (CDS) in Sunnyvale, Calif., is developing a supercooled CMOS mainframe processor that the 74-year-old mainframe pioneer claims will initially notch speeds up to 160 MIPS.

Dubbed the CDS-1, the uniprocessor systems are expected to be ready for shipment by the middle of next year.

"It is great to see someone else coming into the mainframe market," said David Floyer, an analyst at International Data Corp. in Framingham, Mass. "And from a user perspective, the more pressure put on the likes of IBM and [Hitachi Data Systems Corp.], the better."

PROCESSOR SUPPORT

But the one drawback is that at first, the CDS-1 won't support more than one processor. That could limit its use to niche applications, such as large batch operations.

For example, although a 160-MIPS processor would challenge the dominance of Hitachi's Skylines at the high end, the Skyline —which combines air-cooled CMOS chips with older bipolar technology — can support eight processors.

Hitachi has grabbed a 20% share in the mainframe market thanks to the Skyline and user demand for larger processors.

Still, users see potential for the proposed mainframe, especially if CDS can build in support for multiple processors.

"If they can make the CDS-1 play in a parallel sysplex [a mainframe cluster], there are lots of older database systems that require these type of high-speed engines," said Douglas Mackie, a vice president at Zurich Insurance Group in Schaumberg, Ill.

And CMOS processors cost less than Hitachi's Skyline processors.

"If they can support multiprocessing, then [the CDS-1] would be good to install, so you don't have to depend on just one vendor," Mackie said.

CDS's special cooling technology uses helium gas to bring the CMOS processor down to minus 200 degrees Celsius. That speeds processing without requiring additional power to maintain the system.

"CMOS chips run faster when they are cold, so with our technology, you can keep power supply at the same level while the speed can come up to three times more," Amdahl said in an interview last week with *Computerworld* at the Share technical conference in Atlanta.

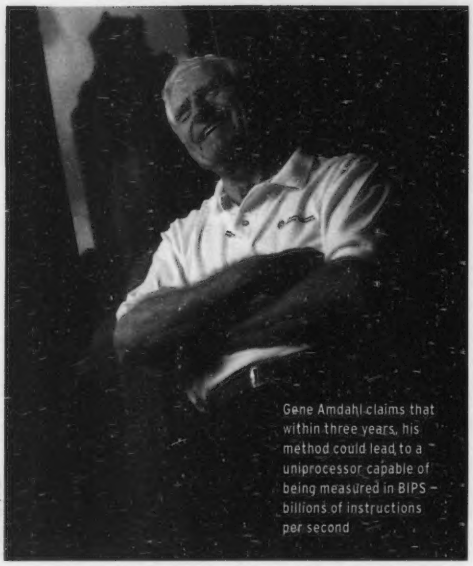
Amdahl said that within three years, his method could lead to a uniprocessor capable of being measured in BIPS — billions of instructions per second — instead of the current MIPS.

The cooling process is well-known, and other vendors such as IBM have similar technology that they also can bring to bear in the market, analysts said. But IBM has focused more on its mainframe clustering technology, called parallel sysplex, to provide scalability and availability, rather than develop large uniprocessors (see chart).

Although there are other approaches, "Gene Amdahl is the first talking about doing this with chips," said John Young, director of enterprise systems planning at The Clipper Group, Inc. in Wellesley, Mass. "He has a head start on the whole market on this right now."

A lot will depend on the success of CDS's first machine, a low-end, 5-MIPS mainframe positioned as a year 2000 testing and application server. □

Amdahl's interview on his plans and the future of the mainframe market is on page 30.



ANN STATES/SABA

Gene Amdahl claims that within three years, his method could lead to a uniprocessor capable of being measured in BIPS – billions of instructions per second

BIG IRON OVERDRIVE

Mainframe vendors' estimations on increasing processor MIPS:

Company	1997	1998	1999-2001
Amdahl*	45	75	150
CDS	---	160	1,000
HDS	120	150	250
IBM	45	60	100

*Gene Amdahl left Amdahl Corp. in 1979

Walking fine line between NT support and OS/2

By Laura DiDio
SAN FRANCISCO

IBM IS WALKING a tightrope.

The company has embarked on a strategy to sell middleware for rival Microsoft Corp.'s Windows NT platform even as it tries to reassure restive customers that its commitment to OS/2 Warp Server is unwavering.

The issue flared anew here last week at the Windows NT Intranet Solutions trade show during an IBM press conference to announce five new middleware packages for Windows NT.

Jocelyne Attal, IBM vice president of NT marketing, cited International Data Corp. statistics that show Windows NT Server shipments outpacing those of OS/2 Warp Server by a 3-to-1 margin this year. Attal said IBM has an all-out initiative to develop "middleware, hardware, services and technical support for the Windows NT platform." In some cases, IBM will deliver the NT components six months ahead of the same facilities on OS/2 Warp Server, according to Attal and Donn Atkins, vice president of marketing at IBM's Personal Software Products Division in Austin, Texas, which oversees OS/2.

Attal reiterated IBM's strategy to narrow its focus for OS/2 Warp Server "from a mass-market [operating system] to one that is targeted at existing customers and new large accounts in the banking and finance industries."

IBM's efforts have some users confused and nervous.

"It's making my stomach churn and shaking my confidence," said David Knight, manager of client/server technical services at Trustmark National Bank, Inc. in Jackson, Miss. He said he fears IBM will pull the plug on OS/2 Warp Server. "How much money and how many resources can IBM realistically pour into two competing operating systems? And how many OS/2 Warp sites are they losing each day? Nobody knows," Knight said.

LOYALTY WANES

Knight said IBM's hedging means that "it's no longer a given that I will go with OS/2 Warp Server as my [operating system] when I upgrade within the next year."

Doug Mitchell, an attorney and information systems manager at Dickerson, Dickerson, Consul and Pocker, a law firm in Las Vegas, concurred. "I recognize that IBM may leave me in the lurch. Anyone who says they're going to unequivocally stick with OS/2 Warp Server in the face of this confusion needs a serious reality check," he said.

Not so, Atkins said. "IBM continues to invest in and enhance OS/2 Warp Server, and we'll release a new version in 1998," he said.

Of particular concern to users is how IBM will resolve which platform takes priority when it comes to delivering add-on middleware, leading-edge services and emerging technologies.

Atkins claimed that "95% of all IBM add-on software and hardware connectivity components are shipping for the OS/2 Warp Server platform." Even so, Attal said the five upcoming middleware packages will ship first for Windows NT and IBM's AIX. There will be a six-month lag before they ship for OS/2 Warp Server.

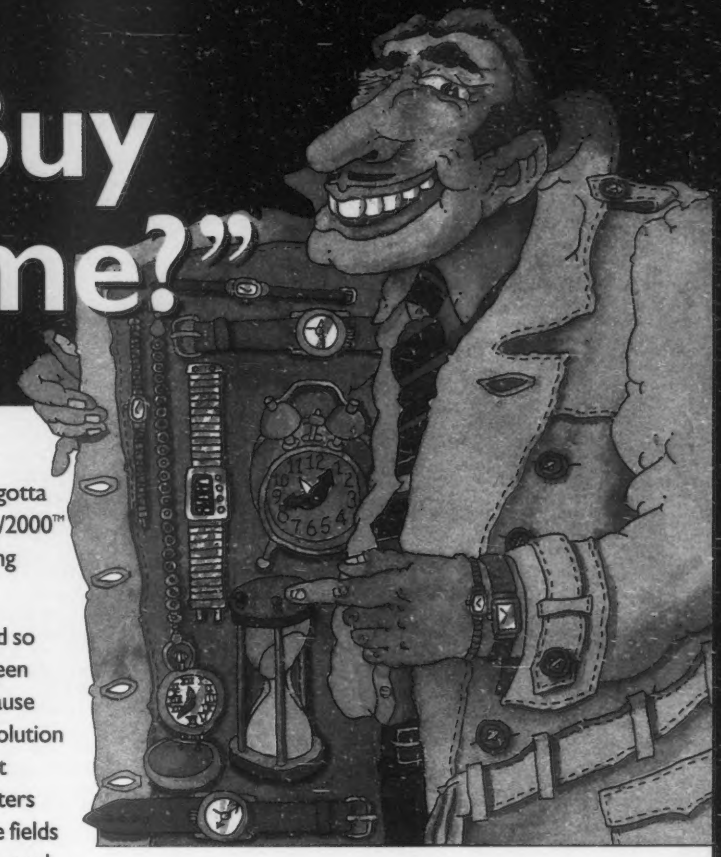
It is that juggling that has users' nerves jangling.

"This could affect my future purchasing decisions. If I need a crucial function right away that's only available on Windows NT or Unix, I won't wait months for IBM to deliver it on OS/2 Warp Server — I'll go buy NT," Mitchell said. □

IBM's commitment to Windows NT

- IBM forecasts a $10 billion market for Windows NT services by 2000
- The company has 9,000 developers worldwide devoted to building Windows NT and Unix applications
- All IBM developers are being trained on Windows NT
- IBM has 1,200 technicians worldwide dedicated to Windows NT support and has nearly 600 Microsoft Certified Support Engineers

"Psst... Wanna Buy Some Time?"



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Finalist

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IS finds ways to monitor apps

▶ *Drive to ensure service kills standards wait*

By Patrick Dryden

UNDER PRESSURE to guarantee client/server service levels to their users, information systems managers aren't waiting for standards-based products.

Instead, users are taking advantage of the many emerging options that enable them to measure application response time, despite the fact that none of the products meet buyers' ingrained requirements for openness and interoperability founded on industry standards.

PATRICK DRYDEN
AIU's Mike Altiero

However, a strong contender surfaced last week, analysts said.

NetScout Systems, Inc. proposed extending data tables in the Remote Monitoring 2 (Rmon 2) application-oriented network monitoring specification to clock the flow of traffic. Other application metering approaches also promise eventual sanctioning by vendor consortia or standards bodies.

"We prefer standardization, but I'll take whatever performance data they can give me," said Patrick Meyers, a network manager at Ceridian Employer Services, Inc. in Bloomington, Minn.

The payroll processor already applies NetScout's monitoring probes and analysis software to measure round-trip delays across its 50-site wide-area network to discover which applications cause slowdowns. Meyers said he is confident that NetScout can push adoption of its application response-time approach as an Rmon 2 standard.

"NetScout's proposal is great, but it won't change the number who will adopt their tools," said Mark Bouchard, an analyst at Meta Group, Inc. in Westport, Conn. "Right now, every tool is proprietary, yet users accept that fact and go forward."

At American International Underwriters (AIU), "we're coping for now" by applying a variety of tools to break down application activity so that central information systems operators can gauge response times, said Mike Altiero, a network services manager at the global insurer in Livingston, N.J.

"We're getting requests to measure response times, but we're being careful to balance standards, cost and need," Altiero said.

Popular application performance analyzers include EcoScope from Compuware Corp. in Farmington Hills, Mich., and WireTap from Platinum Technology, Inc. in Oakbrook Terrace, Ill.

To measure transaction processes more accurately, Hewlett-Packard Co. and Tivoli Systems, Inc. promote application programming interface (API) calls for inserting timers within a program or module.

Such options generate lots of interest "because IS folks are getting hammered by users and by managers, so they're willing to forsake the ideal of open, standard products for tools that do the job now," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

The management software marketplace tends to turn over frequently and fails often in its standards efforts, said Ray Paquet, an analyst at Gartner Group, Inc. in Stamford, Conn.

He recommends tactical solutions with short-term return on investment that solve IS managers' need to ensure the availability and responsiveness of applications.

"Open is a one-word oxymoron in the management arena," Paquet said. "It just means you published your own API and will let everyone else write to it." □

IT workforce

CONTINUED FROM PAGE 1

high-paying vendors and consulting firms that snap up scarce IT talent.

Consulting shops are "drying up the market," said John G. Stevenson, vice president of IT at Lennox International, Inc., a Dallas-based heating and air conditioning equipment maker.

Several chief information officers said the talent crunch is a catch-22: IT consulting and services firms drain the technical labor pool, which forces corporate America to rely even more on consulting shops to install hot software packages such as SAP AG's R/3 and PeopleSoft, Inc. applications.

Devaney, a graduate of Georgia Institute of Technology in Atlanta, explained her decision: "Most of my interest was in the Internet, and I had a preconceived notion that companies like Sun and consultants were the ones doing the most work in those areas."

She said Ernst & Young offered her an attractive salary and extensive opportunities to learn cutting-edge technologies such as Java and Windows NT.

One factor is that recruits such as Devaney believe they will get a wider variety of opportunities in consulting than at a traditional information systems shop because consultants work on multiple assignments. The No. 1 fear of today's college students is boredom, said Connie Pate, recruiting director at Ernst & Young. She said her firm has successfully landed 2,000 technologists this year alone.

The money isn't too shabby, either. At a *Computerworld* recruitment conference in June, recruiters from consultancies offered signing bonuses of $5,000 to $40,000 — figures that cost-conscious corporate users have trouble matching.

"That's why we're having such a hard time staffing positions — contractors and consultants pay better," said Jim Martin, an IT manager at Public Service Co. of New Mexico, an electric and gas utility in Albuquerque.

To fight back, corporate IT shops tell recruits they have more family-friendly environments than consulting shops can offer. IT departments offer less travel, shorter hours, upward mobility into management positions and the opportunity to work through an entire project life cycle.

Public Service Electric and Gas Co. in Newark, N.J., typically hires independent contractors for three-month engagements, evaluates their performance and then moves in for the kill. "If we like what we see, we work hard to bring them on board," said Glenn Rogers, vice president of IT at the utility.

That approach has helped PSE&G plug 25 new technologists into its 375-person IS staff this year. □

TECHNOLOGY ISSUES SURROUNDING CRASH OF FLIGHT 801

- Airport low-altitude warning software covered only a mile around the airport instead of the required 63 miles
- Airport glide slope system, which advises pilots on correct altitude for runway approach, was down for routine maintenance

FAA orders airports to check tracking systems

▶ *Warning system might have prevented crash*

By Sharon Machlis

LOW-ALTITUDE WARNING software wasn't working properly when Korean Air Flight 801 crashed into a Guam hillside earlier this month, investigators say, prompting the Federal Aviation Administration to order U.S. airports using similar equipment to check their systems.

Test results are expected as early as today, according to an FAA spokesman.

The malfunction in the Minimum Safe Altitude Warning System (MSAWS) didn't cause the crash, which claimed more than 200 lives. But the system might have prevented the tragedy by warning air-traffic controllers that the plane was flying too low, a National Transportation Safety Board (NTSB) investigator has said.

MODIFIED SYSTEM

The Guam MSAWS system recently had been modified to stop it from issuing too many false alarms, according to media reports from the scene, and an error was included in the new code. As a result, the warning system was covering only planes flying within a mile or so of the airport instead of the 63-mile radius it is supposed to.

It isn't yet clear whether the MSAWS failure was an isolated programming error or more systemwide. "It's probably a local screwup," said Robert Charette, president of ITABHI Corp. in Fairfax, Va., a risk-assessment consulting firm that has worked with the FAA. "But what are the national procedures to assure these things are working?"

The FAA has been heavily criticized on a number of technology fronts. Air-traffic controllers continue to rely on outdated, deteriorating computer equipment, while systems modernization efforts suffer long delays and cost overruns.

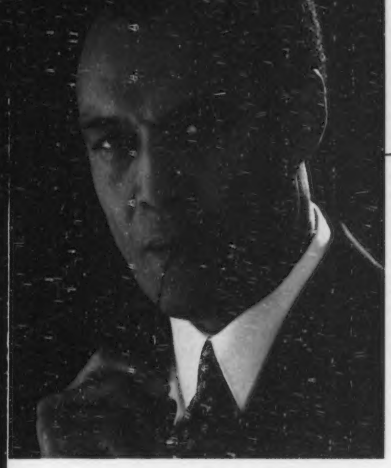
In March, the U.S. General Accounting Office blasted FAA software acquisition procedures as "ad hoc, sometimes chaotic. ... No software project teams measured or reported to management on the status of activities performed, and management never verified that critical activities were being done."

Air-traffic controllers continue to rely on outdated, deteriorating computer equipment, while systems modernization efforts suffer long delays and cost overruns.

The airport altitude warning system hadn't been a technical problem in the past, according to Richard Swauger, technology coordinator for the National Air Traffic Controllers Association in Washington. "MSAWS had pretty much done what it's supposed to do," he said. "It's a pretty reliable piece of equipment."

The controllers are worried more about aging traffic-management systems they still must use and what they consider design flaws with proposed replacements, Swauger said. For example, the new systems will use touch-screen menus that force controllers to take their eyes off radar scopes to type multilevel commands, Swauger said. The existing system uses buttons that controllers can feel without looking down.

The FAA said the system in the U.S. remains safe, and new equipment will increase reliability. But Swauger said time is running out. □



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THINKING OUT OF THE BOX

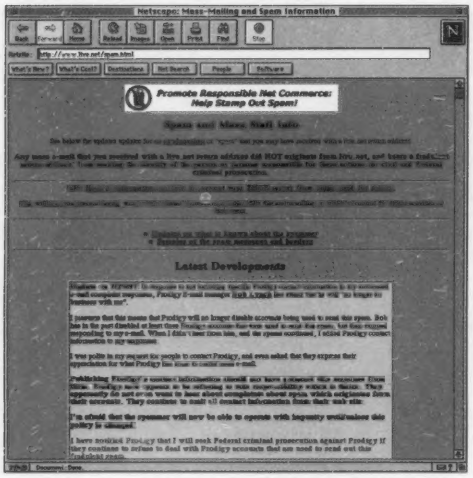
Stung by spam attacks, businesses head to court

CONTINUED FROM PAGE 1

missive purportedly from a Samsung attorney claiming "fraudulent and actionable transgressions" on the recipient's part. Two of Samsung's Web-hosted clients — La Costa Resorts and Big Dog Sportswear — also had suggestive and misleading advertising messages sent out with their names attached. They, in turn, have been inundated with complaints.

Samsung has been so hard hit — getting 6,000 to 10,000 E-mail messages per day and hundreds of telephone calls worldwide — that the FBI is looking into the matter. Samsung has spent millions of dollars on its brand image and desperately wants the spamming to stop.

"We assume whoever is doing this buys lists of E-mail addresses from someone," said Sang Cho, Samsung's in-house counsel, in an interview with *Computerworld*. But the company doesn't know why or who holds the grudge. It intends to file civil and criminal charges when the perpetrator is unmasked.



Live.Net has posted its spam experiences, a reward for information and other helpful advice at www.live.net/spam.html

Fake ads are the latest twist in spoofing and spamming. The Dr. Seussian terms describe an underhanded sneak attack that tries to get ads in front of as many unsuspecting eyeballs as possible by impersonating a responsible sender. For example, Strong Capital Management, Inc., a financial services company in Menomonee Falls, Wis., is suing a spammer for allegedly stealing its address, thinking that recipients would be more likely to open mail from a prestigious firm than an ordinary Internet marketer. Such mail is hated by recipients and is a bane of Internet service providers.

FIGHTING BACK

But now the impersonated legions are beginning to fight back. Although there are no results in any of these cases yet, here is a sampling of businesses going on the offensive with their beefs:

- Two operators at SFF Net, a commercial online service used by science fiction and fantasy writers, have filed suit in Kings County, N.Y., against Carlos Lattin for sending out spamming E-mails with their forged return addresses. Their lawsuit claims trademark infringement, unfair competition, defamation and false designation of origin. The plaintiffs used New York laws to make the alleged impersonator's Internet service provider divulge Lattin's name.
- A novice junk mailer was sued in May by an online floral information service run by Tracy LaQuey Parker, an Internet author and education market development manager at Cisco Systems, Inc. Parker opened the site's electronic mailbox one morning in March and saw what Samsung, La Costa and SFF Net have experienced: an avalanche of returned E-mail and angry letters. "I was shocked by the onslaught," Parker said.
- Jon Tara, operator of San Diego's Live.Net site, has experienced the same problem, but he hasn't been able to track down the spoofing impersonator. He is offering a $100 reward for positive personal identification of the spoofer. A message on the site from Tara to the spamming perpetrator says, "I am going to hound you to the ends of the earth once I find out who you are. You will regret having used a Live.Net return address. If you are lucky, I will never find out who you are. If you are unlucky, I will. It will be the worst luck that you've ever had." Tara has fought with a service provider who has stopped shutting down spammers and won't provide Tara with identity information, claiming privacy requirements. The provider has called Tara's bounty offer "vigilantism."

In February, Matthew Seidl, a Colorado University computer science student, filed a lawsuit against Greentree Mortgage and an unnamed bulk E-mailer for allegedly sending out a batch of spam with Seidl's "nobody@localhost.com" address in the From and Return-Path headers.

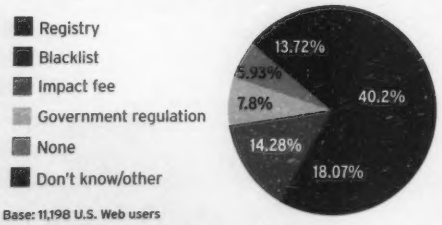
Seidl said in an Internet posting that he decided to take "whatever legal actions we have to take to restore our good name and recover the damages we suffered. We are doing our part to put an end to this type of 'net abuse."

UNLIMITED ACCESS

Such attacks are difficult to deal with, said Nina Burns, an analyst at Creative Networks, Inc. in Palo Alto, Calif. "Wackos have so much access to information that it becomes scary for an individual," she said. "But until authentication and digital signature technology become more widespread, I'm not sure what the answer is."

"We need some sort of digital Caller ID," said Jonathan Wheat, an analyst at the National Computer Security Association in Carlisle, Pa. Until then, Wheat said, this may be the price we pay for ever-increasing Internet connectivity. □

What is a good solution to Internet spamming problems in the U.S.?



Base: 11,198 U.S. Web users

Source: Georgia Institute of Technology's Graphic Visualization & Usability Center, Atlanta

Service providers won't release names

Although sympathetic to spam recipients, few Internet service providers will give out subscribers' names without a court order.

At EarthLink, Inc. in Pasadena, Calif., there are daily postings on the Internet provider's site of spammer accounts that have been canceled. Steve Dougherty, director of Internet operations at EarthLink, said, "These spammers are like cockroaches, and when you step on one, others just keep coming back."

Dougherty said EarthLink, with 330,000 subscribers nationwide, won't release the name of a spammer who uses its network to a customer but would probably comply with a legal order. "We might contest it, but we're a legal entity, and we comply with the law," he said.

Prodigy, Inc. in White Plains, N.Y., one of the top three online services, notifies spammers that spamming or advertising is a violation of member policy, a spokesman said. A second violation results in a warning, and if spamming happens a third time, the member's services are terminated.

To combat spammers on its service, UUnet Technologies, Inc. limits the length of E-mail recipient lists, blacklists mail sent from known spamming locations or organizations, filters news postings from sources whose identity can't be authenticated and won't pass along third-party mail messages to non-UUnet destinations — a common technique used by spammers to hide their identities.

"We allow members to block an entire domain if they don't like what they're getting, but we would never ID the spammer if it was our own member. That's private information, and we don't release it," said Prodigy spokesman Mike Darcy. "We don't want to create a vigilante-type atmosphere, so we won't give people names to attack them."

If the spam's origin is traced to another Internet provider's network, Prodigy will contact that provider. But whether it cooperates in releasing information about the spammer is up to that provider's policies, Darcy said.

But some providers are more sympathetic to subscribers' needs. Wizvax Communications, an Internet provider in Troy, N.Y., started billing customers who send out spam mail. If it can find one particularly egregious spammer, the provider will hold them responsible for a $140,000 unsolicited E-mail processing bill. — Stewart Deck and Matt Hamblen

WHAT TO DO?

First aid for spamming and spoofing attacks

- Take the attacks seriously
- Notify your service provider
- Ask your service provider to partner with others to track down spammers
- Notify legal authorities
- Look into authentication and digital signature technology
- Consider legal action

Internet providers fight back against spammers

▸ *Weapons range from canceling accounts to legal actions*

By Stewart Deck and Matt Hamblen

WHEN SPAMMING impersonators are finally tracked down, it turns out there are several crimes they can be charged with.

A case pending in New York charges the defendant with trademark infringement, deceptive trade practices, unfair competition and false designation of origin. The latter means deliberately mislabeling a product in an attempt to trick people into thinking it came from a more reliable source, according to Stevens Miller, the plaintiffs' attorney.

Miller said similar cases in other states — such as the Flowers.com case in Texas — have been filed for negligence, trespass, misappropriation of a person's name for a business purpose or defamation.

"Most [service providers] are looking to be supportive, and most of us are antispam."
– Jeff Cartwright Planet Access Networks

Where a case is filed can help the plaintiff uncover the spammer's identity.

New York, for one, has passed a law that lets an injured party with "just cause" demand the identity of a spammer from an Internet service provider so that the spammer can be named in the lawsuit.

Internet service providers typically won't release the name of a spammer, citing privacy privileges.

But often they will terminate spammers' accounts and add tools to uncover spamming practices.

Jeff Cartwright, president of service provider Planet Access Networks, Inc. in Stanhope, N.J., said end users may not realize they have legal powers to subpoena Internet service providers for information about who is spamming them. "Most [service providers] are looking to be supportive, and most of us are antispam," he said.

There have been several instances of spamming through servers at Planet Access, a regional Internet service provider. In some cases, Cartwright said, he has gone to other service providers in an unofficial way to seek the user name or the real name of the spammer in order to pursue legal action, including service termination.

"I would try to get information from another [service provider] and then contact the person [doing the spamming] and send them an invoice, charging them $15 for every user on my server who gets the message," Cartwright said.

Some businesses are trying to charge spammers per piece of mail sent using the spoofed address, or space taken up on the server. One online posting advocates a "get even" approach. Its site warns interlopers they will be charged for using the company's server space and bandwidth. "Those people who send you junk mail are requesting use of your space. Bill them for hours, days or months that the mail sits in the accounts and waits until you retrieve it." □

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Web service speeds resume sifting

▶ *Relational database simplifies resume-retrieval process*

By Julia King

INTERACTIVE SEARCH, INC. (I-Search), a small Los Angeles software company, is winning over big corporate customers with a one-of-a-kind Internet service that transforms electronic and paper resumes into an easily searchable relational database.

Motorola, Inc., Texaco, Inc. and TRW, Inc. all use of I-Search's Private Reserve service. The service receives, scans, formats and indexes thousands of resumes sent to the employers each week.

Forty-eight hours later, the employer receives back a highly structured relational database that multiple hiring managers can search simultaneously using an Internet browser.

The service costs $5,000 per year, plus $2.50 per resume. The cost savings, by contrast, can add up to hundreds of thousands of dollars, users said.

"I-Search costs about 10% of the cost of a full-blown [automated resume-tracking] system," said Bob Hungerford, staffing manager at a Seagate Technology, Inc. division in Scotts Valley, Calif.

"It doesn't keep track of who was interviewed and who was hired like other automated tracking systems, but for resume-retrieval, it's a lot simpler," he said.

"The fact that we can now go in and limit our search based on the qualifications for a particular position ... is a big benefit."
– Brie Silveria, Cypress Semiconductor

I-Search President John Reese said the service employs a commercialized version of the text analysis technology used by the U.S. Department of Defense in intelligence operations. It dissects resumes into more than 50 parts, which are then mapped in a standardized way into a searchable database.

That lets recruiters search according to very detailed requirements. For example, a recruiter looking for industry expertise can quickly target applicants who previously worked at a competing company.

Searching preprocessed resumes is also a lot faster, said Brie Silveria, who works in corporate staffing at Cypress Semiconductor Corp. in San Jose, Calif.

Previously, Silveria would need to at least "eyeball" each of the roughly 500 resumes that Cypress received in response to an employment advertisement. But only a handful actually fit the job criteria, she said.

Now, Cypress directs applicants to send resumes directly to I-Search, which returns them to Cypress in the form of a structured relational database.

"The fact that we can now go in and limit our search based on the qualifications for a particular position and not have to go through hundreds of resumes by hand is a big benefit," Silveria said.

Jerry Michalski, an analyst at Release 1.0 in New York, described the I-Search service as one of the most sophisticated for handling "the big and tedious tasks" of scanning, indexing and translating hundreds of resumes at a time. □

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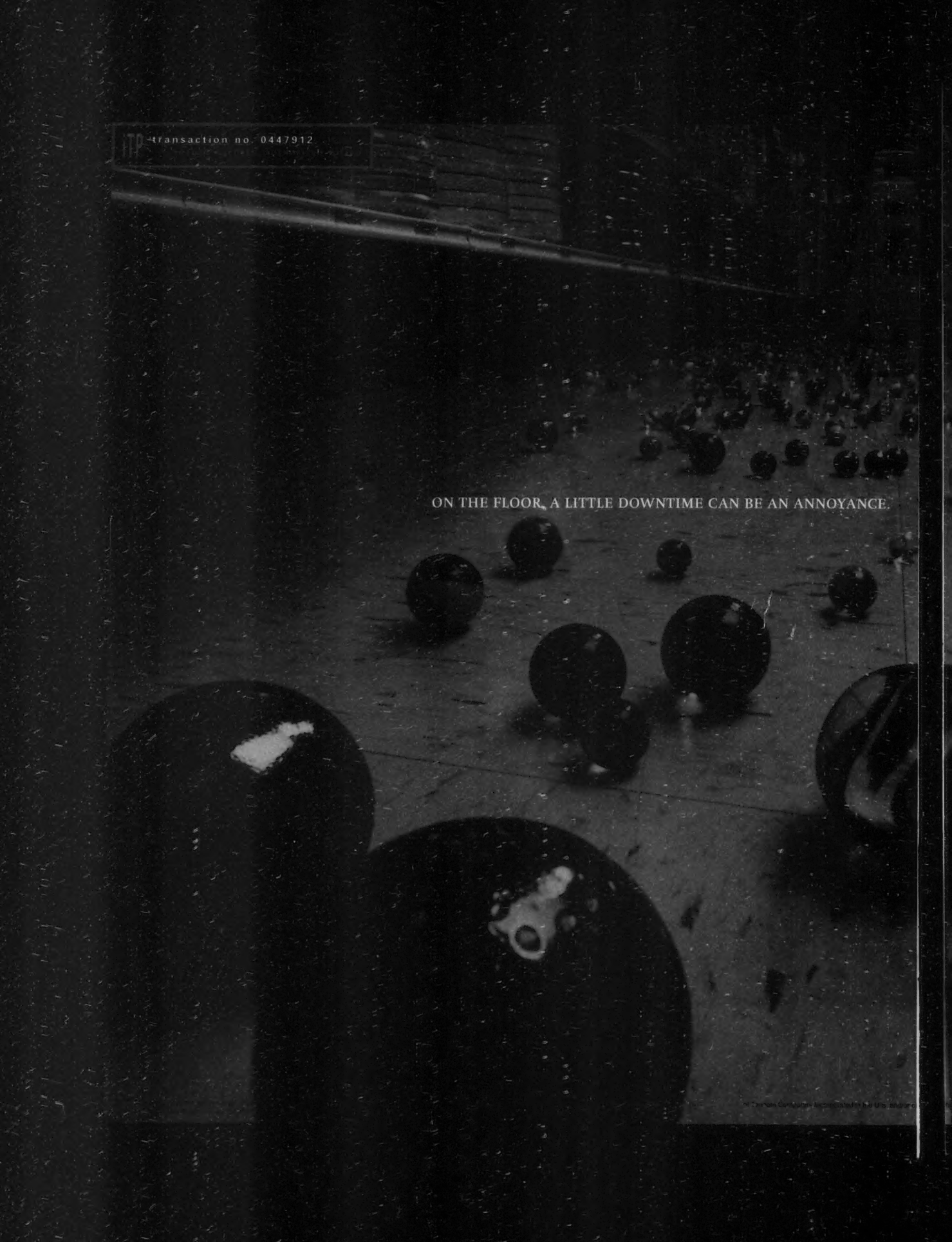

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Lucent tool automates IP address changes

By Matt Hamblen

WITH THE INTERNET growing, the number of user addresses added or changed per day can pose a management nightmare for Internet service providers and managers of large private networks.

To address that management need, Lucent Technologies, Inc. in Murray Hill, N.J., announced software that eliminates manual input of Internet Protocol addresses.

Version 2 of its Scalable Domain Name Server software starts at $7,500, and is available for Sun Microsystems, Inc. Solaris systems. A Windows NT version will be available early next year, Lucent officials said.

For Planet Access Networks, Inc. in Stanhope, N.J., the software helps reduce management costs and eliminates server downtime when changes and updates are made, said Jeff Cartwright, president and director of communication technology at the regional Internet provider.

"The alternative would be that every time you'd make a name change, you'd stop and restart the names services server, and that delays things," Cartwright said. With 2,000 clients and 50 or more changes per day, the older method would take several minutes, which would be unacceptable, he said.

Release 2 of Lucent's Scalable Domain Name Server software includes the following:

- Capacity of 1.5 million IP addresses
- The ability to handle 2,000 queries per second, or 172 million per day
- Tightened security
- Simpler interface

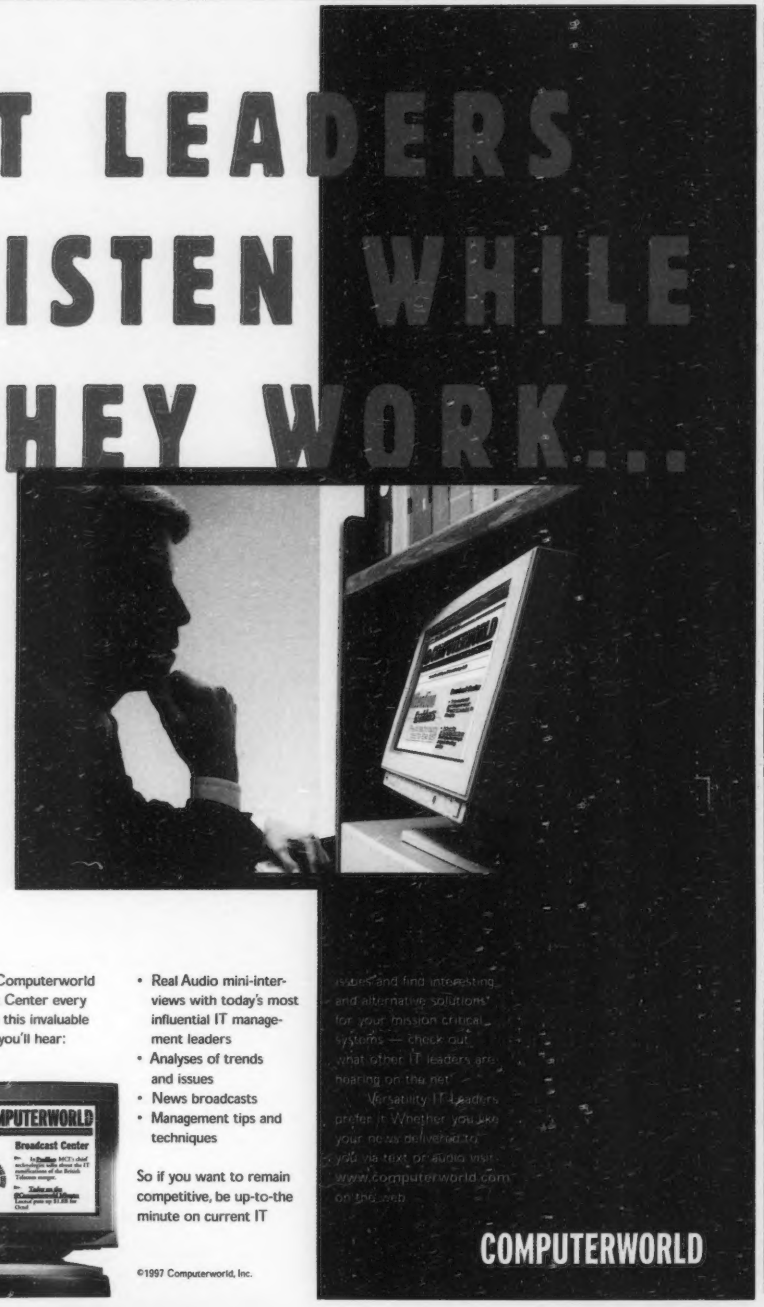
Because the software uses a simplified graphical interface rather than manually entered code, Cartwright has been able to use office assistants to make changes rather than higher-paid and highly trained operators. "It's a major cost issue for us, and because there's not a charge for each change, it's an uncontrollable expense," Cartwright said.

Cartwright said name services "are at the very core" of the functionality of the Internet. A typical change might happen when a company decides to add a new suffix to its existing address or adds workstations to its network. Each workstation typically needs its own unique name to receive Internet messages, including electronic mail.

Lucent is a recent entry in the domain name management software field, which includes vendors Cisco Systems, Inc. in San Jose, Calif., which bundles it with routers, and Bay Networks, Inc. in Santa Clara, Calif., analysts said.

The market is small and will be about $50 million next year, but it should grow as the Internet blossoms, said analyst Mike Arellano at Degas Communications Group in New Providence, N.J.

"It's an early step for Lucent to show that they know how to do networks," Arellano said. When only a few sites were being added a day, such software wasn't necessary. "But it's a different story now," he said. □



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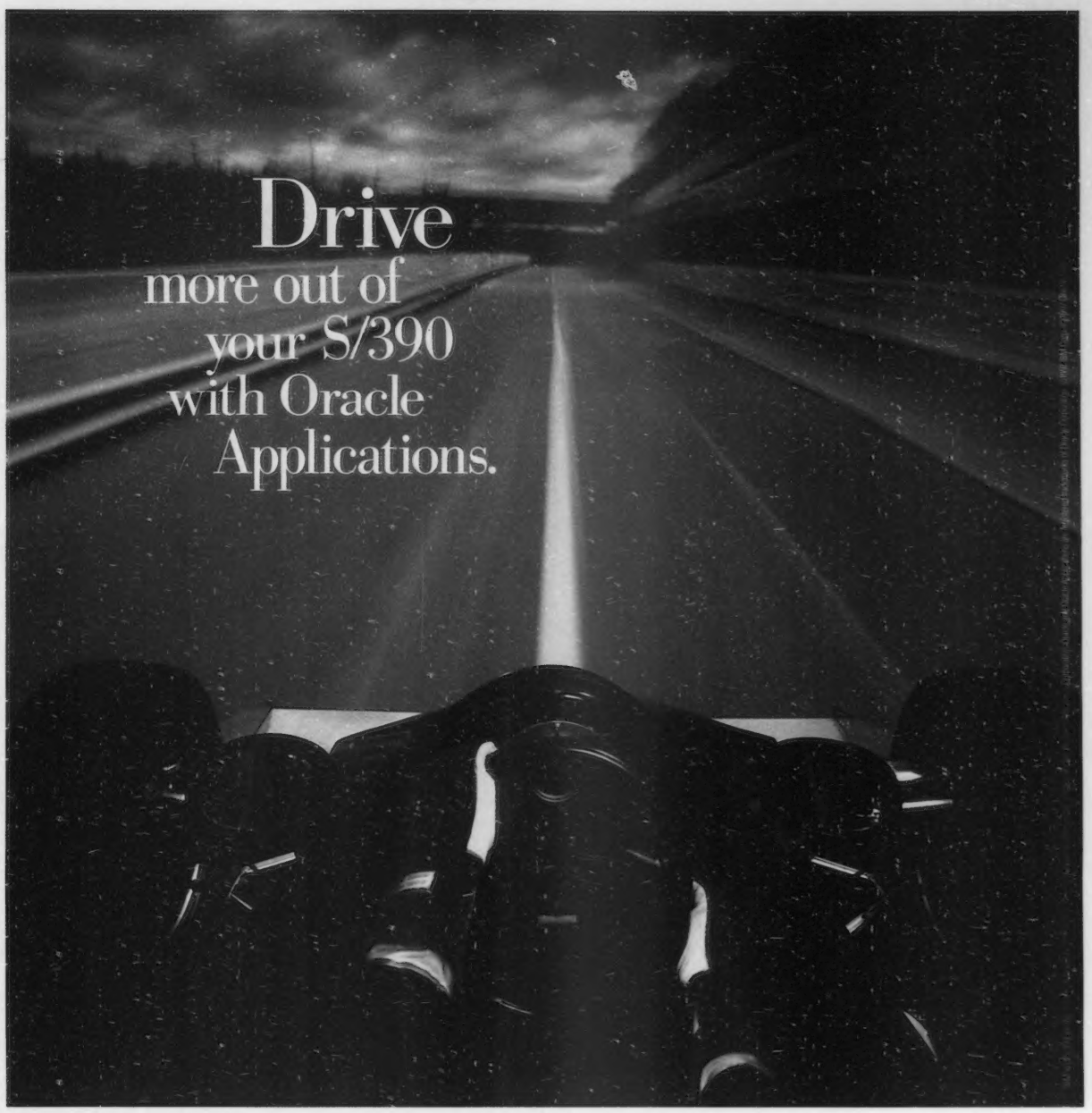

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Disney site bucks online conventions

By Mitch Wagner
WEST HOLLYWOOD, CALIF.

FORTY YEARS AGO, The Walt Disney Co. won the hearts of a generation of Baby Boom children with a pioneering children's show on the cutting-edge medium of the day, television.

Now, the same company is looking to put Mouseketeer ears on today's new medium — the Internet.

On its Disney's Daily Blast site, the $18.7 billion giant is breaking a couple of the cardinal rules of consumer-based online commerce: namely that consumers won't pay for online entertainment and that companies should develop a simple site that's accessible to the lowest common denominator of computing hardware and software in order to attract the broadest possible audience.

E-COMMERCE STRATEGIES

Disney charges a $4.95-per-month subscription fee and requires users to have state-of-the-art technology to access the site. To view the site, consumers need a Pentium-class or higher PC running Windows 95 and a 28.8K bit/sec. modem. An Apple Computer, Inc. Macintosh version of the site is due next month, but it will have similar high-end requirements. The site also requires more than 2M bytes of multimedia plug-ins to view.

John Robb, an analyst at Gomez Advisors in Boston, said the strategy is risky. Despite brisk sales in high-end multimedia systems recently, many consumers are still accessing the Internet from 486-based systems and 14.4K bit/sec. modems through online services such as America Online and CompuServe.

"Disney's made a choice. The market they're going for is relatively small, but they tend to be leading-edge folks — only 3 or 4 millon people, but they tend to be well-equipped. They also tend to have the discretionary income to spend. It makes sense," said Richard Wolpert, executive vice president at Disney Online.

"Without a doubt, Blast is going for a higher-end user experience."
– Richard Wolpert, Disney Online

AMY ETRA

A BLAST FOR KIDS

The Daily Blast site is an online service for kids age 12 and under. It offers animated storybooks, downloadable games, educational toys and puzzles, and sports and news written and reported by children.

It provides a mix of the usual wholesome Disney fare — Mickey, Donald, Goofy and the rest — along with content designed to be a little more hip, appealing to kids' love of a good clean gross-out joke or weird humor. The tone is somewhat *Mad* magazine-ish. The site was launched in April.

Disney Online also provides several sites for free, including *www.disney.com* — the company's marketing-oriented site — a parenting site and sites affiliated with the Disney-owned ABC TV network. Disney also owns a majority interest in Starwave Corp. in Bellevue, Wash., which runs several sites, including ESPN SportsZone.

The free *www.disney.com* consistently ranks in Internet ratings as one of the most popular sites. But it is Daily Blast that is the centerpiece of the Disney Online operation and where Disney is taking the biggest risk — charging a subscription. The overwhelming majority of sites on the Internet are free, and those that charge subscriptions — such as *The Wall Street Journal* site from Dow Jones & Co. in New York — are seeing uncertain results. Microsoft Corp. was in the spotlight when it postponed indefinitely plans to charge online subscriptions for its webzine, *Slate*.

SUBSCRIPTION SUCCESS

Disney believes it can find success with the subscription model simply by pouring a lot of effort and high-quality content into the site, changing content daily and providing a rich, multimedia experience. Similarly, the *Journal* site — though text-based, — changes every day. Another high-profile for-pay site, the Playboy Cyber Club, features multimedia, live chats and content that changes regularly.

Jim Balderston, an analyst at Zona Research, Inc., said that most of the sites that do charge for content on the Internet, such as the *Journal* site, offer business-oriented information. "It is unclear whether sites like that, without the mission-critical, gotta-have-it-for-work component, will be successful in charging," Balderston said.

But Jake Winebaum, president of Disney Online, said his company is confident that if it builds sufficient, high-quality content into the site, Disney will be able to overcome consumers' resistance to paying for World Wide Web content.

MARKETING POWER

And Disney also has its enormous marketing machine. The company advertises extensively and offers a one-month free trial, Winebaum said. And subscriptions aren't the only source of revenue from Daily Blast. The company also sells advertisements and plans to offer the site in reseller agreements with major online services and Internet service providers. Meanwhile, Microsoft offers free access to Daily Blast for users of The Microsoft Network, a privilege for which Microsoft pays Disney.

Disney wouldn't comment on how much of its Daily Blast revenue comes from consumer subscriptions and how much comes from other sources, but it said the consumer subscription revenue is significant.

Disney charges for the site because it believes common wisdom is wrong. It said consumers will be willing to pay for a site if it offers a lot of high-quality, original, fast-changing content and is very different from other Web sites — and if the company running the site uses marketing to overcome consumers' aversion to paying. □

Analysts question plan to link data marts

By Kim S. Nash

INFORMATICA CORP. next week plans to announce a scheme to link dispersed data marts through the use of additional databases and tools.

Analysts said the idea is laudable, but may require too much forethought and rigorous information systems oversight to really take hold.

The proliferation of lone mart islands has been a problem for users who want to query data from more than one department or do a companywide analysis.

Informatica's theory is that if users build marts to a detailed set of Informatica-invented specifications, those marts will be able to communicate with one another and with a larger "traffic cop" repository.

The approach, which includes a set of databases and tools due by year's end, may be wishful thinking, some observers said. "It's a worthy goal, but may not be feasible," said Henry Morris, an analyst at International Data Corp. in Framingham, Mass.

One reason is that IS managers "can't completely control marts" to make sure they are built uniformly, Morris said.

Users can create them without IS help, and many financial applications, such as those from PeopleSoft, Inc., come with their own pseudomarts already built in, Morris said.

Under Informatica's Enterprise Data Mart plan, users would build marts with cooperation in mind from the start. The marts would use the same data definitions and formats for meta data, which is technical information about how and where the data is stored.

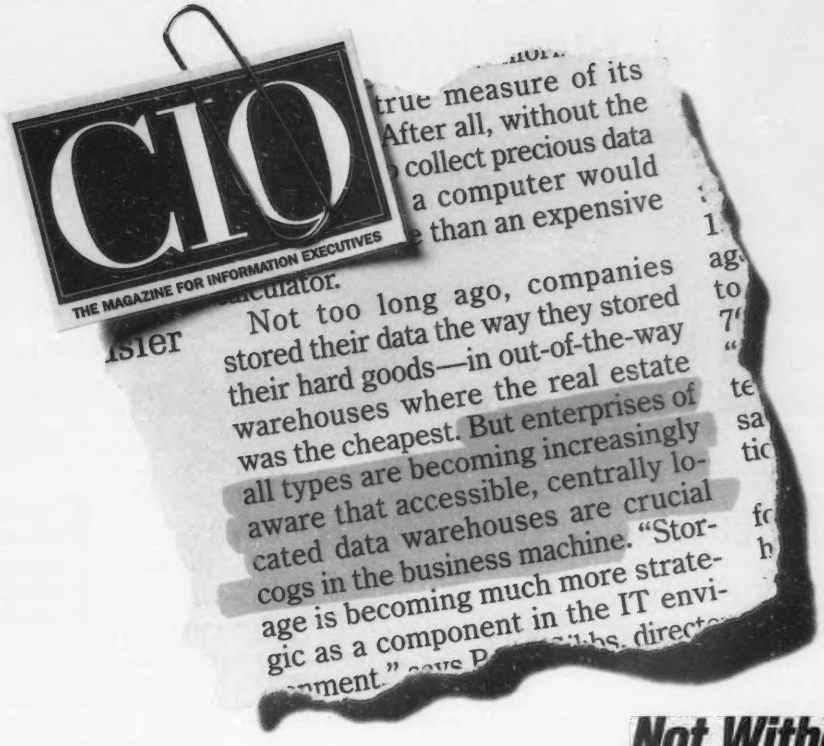
A database, called a Dynamic Data Store, would hold common information extracted from all existing marts. Users could then query that catch-all database.

Another database, called a Global Data Mart Repository, would manage the meta data to make sure queries were routed to the right marts, no matter which department the inquiring user worked in.

But the plan won't work with non-Informatica data marts without at least some reworking of the nonconforming databases, said Diaz Nesamoney, Informatica president and chief technology officer.

Prices haven't yet been set. □

& **Data quality is foremost concern in building a data warehouse. Page 71**



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Gene Amdahl:

"I am amazed at the number of things reinvented in the computer industry on other platforms"

ANN STATES/IDABA

Mainframer after all these years

Gene Amdahl is a pioneer in the mainframe world and founder of Amdahl Corp. and several other companies. Amdahl, 74, has a new company — Commercial Data Servers, Inc. — and a new mainframe, the CDS-2000 [CW, June 9]. He also is readying a high-end mainframe system with special cooling technology that could tackle the market leaders (see story, page 12).

Amdahl sat down with Computerworld *Senior Editor Tim Ouellette during last week's Share Technical Conference in Atlanta to talk about his plans and the future of the mainframe market.*

CW: When did you decide to re-enter the mainframe business?

AMDAHL: I have never really been out of it. But in the early 1990s, there was so little interest in the mainframe market that it was hard to raise new funding.

CW: Do you think the market is still strong enough?

AMDAHL: When you try to determine how much of the mainframe market got displaced by distributed systems, it was only about 2% displacement. The over $1 trillion in legacy software out there would have cost more than that just to convert to another platform.

CW: How do you think today's mainframes stack up against distributed platforms?

AMDAHL: The mainframe is cheaper overall than most alternatives, and with the CDS-2000, we are cheaper than most mainframes. I am amazed at the number of things reinvented in the computer industry on other platforms. People often have no idea what was done before on the mainframe — and oftentimes they are decades behind technology already put on the mainframe.

CW: How did you develop the CDS-2000?

AMDAHL: It did not start as an actual product, but as a test bed for our I/O structure we have developed. But then we recognized that it made a mean product for the year 2000. There are some 10,000 older IBM machines whose operating system won't be upgraded for the year 2000, and users need a simple testing bed for their changes.

The mainframe is cheaper than most alternatives.

CW: Does the fact that Amdahl Corp. is being bought by Fujitsu Ltd. affect the sales and service deal you have with it to support the CDS-2000?

AMDAHL: No, it doesn't affect our agreement. It actually might be somewhat helpful, since Fujitsu may service some locations worldwide that Amdahl does not have access to right now.

CW: Are you sad to see your old company lose its independence?

AMDAHL: I came to terms with my feelings about Amdahl Corp. back in 1979 [when he broke all ties with the company]. For me it was the loss of my baby then.

CW: Where do you see the S/390 market in the future?

AMDAHL: There will certainly be some applications you may want to off-load off of larger mainframe systems. But in these cases, since mainframes are getting cheaper, a smaller mainframe like the CDS-2000 could be used to run Lotus [Development Corp.'s] Domino or some other isolated applications. □

Briefs

Informix raises cash

Informix Corp. raised $40 million from Fletcher Asset Management, Inc. in New York, which it plans to use for ongoing operations. Informix, which lost $120 million in its latest quarter, also said Fletcher might buy an additional $35 million worth of preferred stock in the future.

EDS wins $3.8B deal

Electronic Data Systems Corp. won its second multibillion-dollar contract this month. The Plano, Texas-based company said it will provide computer services to Commonwealth Bank of Australia under a 10-year deal for an estimated $3.8 billion. EDS recently won a $4 billion deal with BellSouth Corp.

Wang earnings rise

Wang Laboratories, Inc. in Billerica, Mass., said its fourth-quarter profit rose 51% over last year, from $8.2 million to $12.4 million. Revenue rose 36%, from $248 million to $338 million. Wang attributed the strong showing to new business in network and desktop management services. For the year, Wang earned $70 million; it lost $600,000 the prior year.

Digital/Intel brouhaha gets chippy

▸ *Battery of countersuits may hasten settlement*

By Jaikumar Vijayan

INTEL CORP.'S countersuit against Digital Equipment Corp. on 14 counts of patent infringement, filed last week, sharply escalates the chip war between the two companies.

But it is unlikely that the move will have any immediate impact on Digital's ability to continue selling systems based on Intel chips.

And some observers said Intel's countersuit only increases the chance of a negotiated settlement between the two companies.

"Proving patent cases of this nature in court [is] a nightmare because you have a lot of fairly arcane technology" that is often beyond the comprehension of jurors who decide on such cases, said Dean McCarron, an analyst at Mercury Research, Inc. in Scottsdale, Ariz.

As a result, companies that have been sued over patent infringement sometimes rely on countersuits to bring the other party to the negotiating table, McCarron said.

Advanced Micro Devices, Inc. and Intel, for instance, arrived at such a settlement after a similar dispute.

Digital fired the first salvo when it sued Intel for copying up to 10 of its patented technologies in processors such as the Pentium and Pentium Pro. Intel returned fire last week when it claimed that Digital did likewise with 14 patents relating to microprocessor architecture and design.

Whatever the outcome, the legal posturing of the two companies is likely to be a costly preoccupation for Digital at a time when the company can least afford it.

The Maynard, Mass.-based company is battling several fires in its effort to turn around its sputtering business. Only last week, Digital sold its unprofitable $100 million printer business to Genicom Corp. in Chantilly, Va., for an undisclosed sum. The sale came on the heels of reports that Digital is also planning to sell its fading $600 million network products division.

The moves are in keeping with Digital's recent efforts to divest itself of what it considers to be costly and nonstrategic businesses (see chart).

CHIP WAR CHRONOLOGY

May 13: Digital files suit against Intel, citing 10 counts of patent infringement

May 28: Intel sues Digital for failure to return "confidential documents" that pertain to Intel chips

Aug. 12: Intel sues Digital on 14 counts of patent infringement

TIGHTER MARGINS

Such sales have made Digital a more focused and leaner company, but they also mean that the company now has to rely on a much smaller stable of products and services, said Terry Shannon, editor of "Shannon Knows DEC," a newsletter published in Ashland, Mass.

Digital closed its 1997 fiscal year with revenue of just over $13 billion — a decline of $1.6 billion compared with 1996. The company claims the decline resulted from falling Alpha server revenue, fluctuating currency rates and sluggish business from services.

Digital has said it will focus strategically on the Internet, Alpha servers, 64-bit technology, Windows NT, Unix and OpenVMS at the highest end. □

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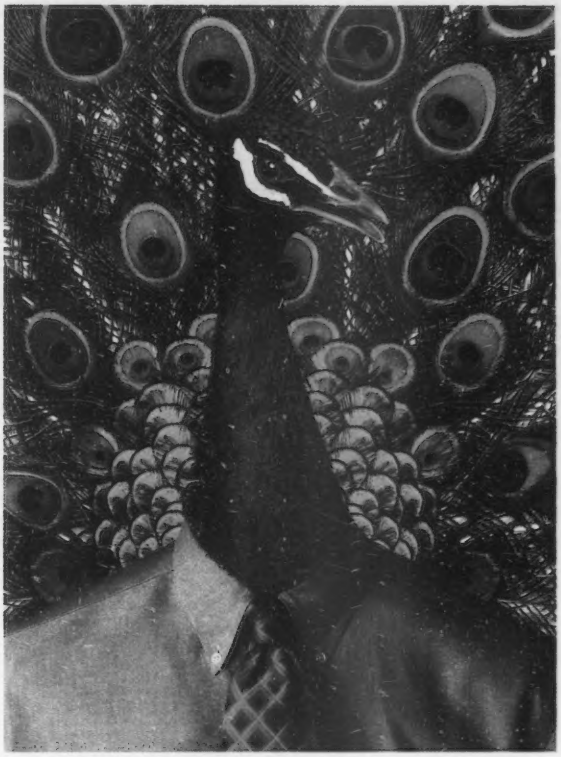

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OPINION

What matters The quiet heroics of Guam government webmaster Gregory Okada went

mostly unnoticed in the terrible wake of the Korean Air Lines disaster. Here was an ordinary IS guy, a technical support specialist whose job probably never attracted the attention of the outside world.

But Okada woke up the morning after the crash and realized he could directly help with the urgent need for information from his remote island. He and a friend at the nearby university where the Web server was housed turned the *www.guam.net* Web site into a constantly updated resource for everyone from distraught family members to the news media worldwide ["Guam tragedy spurs Web aid," CW, Aug. 11].

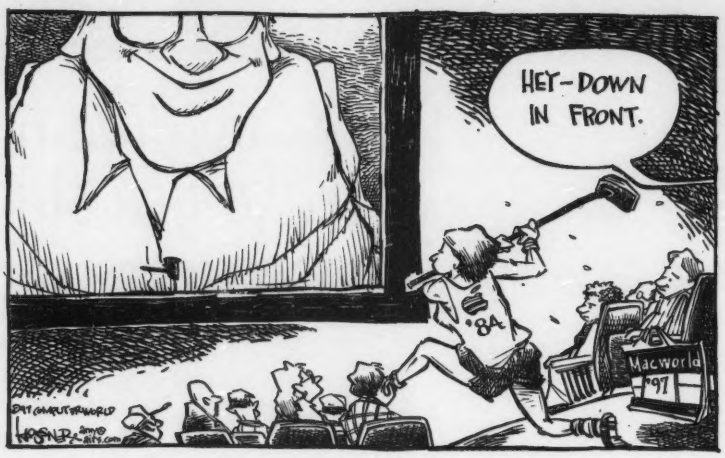
Like tens of thousands of IS professionals do every day, Okada used his technology expertise like a leader — someone who understands the power of the right tool used for its greatest impact. But in a larger sense, his actions illustrate the profound changes the Internet and the Web have had on our lives. In the tiny space of a few years, the 'net has become the most broadly available interpersonal communications tool in history.

As one Red Cross official in Guam put it, "What makes the Web really handy is that distance tends not to be a factor — you're able to access that information as if it was next door."

Where once people would have gathered around a TV set to experience historic events such as the NASA mission to Mars, today they turn to their Web browsers and log on. NASA expects as many as 1 billion hits at its Pathfinder site by the time the mission ends. A few months ago, the FBI reported the first arrest of a suspect on its "Ten Most Wanted Fugitives" list because of a description posted on the Internet.

These days, when all that our industry seems to talk about is the money-making potential of the Web, the dedication of that webmaster in Guam was a wonderful reminder of what really matters.

Maryfran Johnson, *Executive editor*
Internet: *maryfran_johnson@cw.com*



LETTERS

Readers debate Microsoft's declaration of war on Sun's Java strategy

THE STORY "Microsoft declares war" [CW, July 28] makes it clear that Microsoft doesn't care whether Java is cross-platform. Why should it want to support Apple, Sun, SGI and others?

For years, all the trade journals have been saying that Borland produces superior language compilers and development tools. In spite of this, purchasing managers made the safe decision and bought Microsoft.

We are looking at the end of any competitive market, and the fault is all our own: our managers, our CEOs and their shortsighted vision.

Douglas K. Ahlquist
San Jose, Calif.

I ENJOYED your interview with Microsoft's Paul Maritz ["Maritz: Why Microsoft won't ship Sun's Java class libraries," online at *cwlive.cw.com:8080/home/online9697.nsf/All/970725maritz*]. One statement of his was particularly worth noting: "Sun likes to blur ... the notion of Java the language and Java the class libraries. They'd like to package them all into that concept. We're just saying, 'Hey, there is a difference between the two. Let's be clear on that.'"

Maritz apparently forgot that he lives in a glass house. Microsoft's yet-to-be-released Internet Explorer 4.0 and the next release of Windows 95 suffer from similar blur. Indeed, it's difficult to determine where the Internet Explorer 4.0 beta release stops and the upgrade to Windows 95 begins.

Jim Kimble
Saratoga, Calif.

I DON'T KNOW where Microsoft trains people to stick to the party line so completely (and I thought Maritz did a *really* good job), but it seems clear from his comments that he couldn't disagree with your assertions.

Andy Turk
Sarrus Software, Inc.
Burlingame, Calif.

Microsoft's caviling about JFC doesn't ring true.

AS A JAVA programmer, I am being forced to make choices and will have to do more work because Microsoft refuses to ship Java Foundation Classes (JFC) on Internet Explorer or Windows. Maritz urges us to separate the language from its libraries, but any C/C++ programmer can tell you that those languages have their own ANSI-blessed libraries. Why can't Java?

Maritz describes JFC as a competing operating system. This seriously mischaracterizes JFC, which only changes Java's GUI. Specifically, JFC consists of new GUI controls and a new drawing API. The pieces of Java that Microsoft already supports, such as multitasking and network connectivity, have more to do with operating system functionality than JFCs do.

It's also amusing that Maritz referred to JFC as heavyweight. The new JFC GUI components for Java 1.2 are lightweight components — yes, that's the technical term — which means they will require none of the native data structures or peer classes that the Java 1.1 GUI requires. Microsoft's caviling about JFC just doesn't ring true.

Charles Kerr
Programmer/analyst
Oklahoma City

MICROSOFT CLAIMS that the JFCs aren't inferior or technically unsound — only that Microsoft refuses to put another operating system and bloat on its Windows platform. In what way are the JFCs bloated? They aren't substantially larger than any other class library (the entire collection of classes will likely be less than one-fourth the size of an MFC4x.dll file, of which most of us have many).

Putting classes on a system doesn't make it run slower. The only possible fear is that putting the JFCs on Windows will encourage people to *use them*, which is purely a competitive issue.

The JFCs will simply be *the* way that GUI applications are done in the not-too-distant future.

Tim Triemstra
Atlanta

I LOVED Maritz's quote about not shipping "another bloated operating system." You'd think they'd be pretty good at it by now.

Dylan Tynan
President
/dev/null Internet Consulting
Austin, Texas

Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

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COMPUTERWORLD

·Leadership Series·

From the Editors of Computerworld

Shopping Smart

BY DALE KUTNICK

A Better Way to Buy IT through IS/Line Cooperation

TWO HEADS, ONE PURSE: Now that IS shares IT purchasing power with line management, the old methods of buying software won't cut it. Meta Group's Dale Kutnick provides a way for users and IS to work together to get the right system at the best price.

IT'S SHOW TIME.

The power shift between IS and line managers requires a change in how purchasing is done.

The IT leaders of a large distributor of pharmaceuticals are about to enter a lengthy, intense and costly search for an enterprise resource planning (ERP) software vendor.

The company wants this ERP system to support an Internet-based application encompassing Internet ordering, purchase order and invoice management, customer billing and product inquiries, and a laundry list of other functions and options.

Sound like a mission for IS? Not quite. The company wants the purchasing process to be true to the organization's business objectives, budget and time frame. To ensure that happens, it has put together a search team of line and IS managers to determine how the company's IT dollars will be spent.

What's happening here reflects a new reality: The power of the IT purse is passing from the IS organization to the business side, to line management. When IT decentralization, brought about by distributed computing and new Internet-based initiatives, is coupled with the trend toward "lean and mean," IT budgets get pushed further down into line organizations. As profit-and-loss responsibility moves down the hierarchy, business people are taking a full-time role in IT-related planning and implementation.

There's another reason: IS's track record. IS organizations have a history of promising "better, faster and cheaper" without quantifying deliverables, business value or costs. More than 40% of IT projects do not meet business needs and

almost 50% of medium-to-large development projects are canceled.

It's no wonder Meta Group, Inc.'s research indicates that more than 55% of current IT spending is controlled by line organizations, with that number expected to jump to 80% by 1999. Line organizations and their managers now have far more control over IT spending and projects then they have ever had before.

However, these newly empowered line managers are often poorly equipped for making software decisions. If not properly managed, this realignment of purchasing roles and responsibilities can lead to software purchases and systems development efforts that fail to meet business objectives, come in over budget or result in other disasters. You can guess who will probably be held responsible when that happens.

This new world needs a different approach to IT management. In particular, this power shift between IS and line management requires a change in how purchasing is done. Software purchasing is not the only area where this realignment is being played out, but it's an important one.

Purchasing initiatives are typically high profile, high priority and establish future roles and responsibilities. When it comes to the issue of IT-business alignment, it's one place where the rubber meets the road.

The new power structure means traditional purchasing mechanisms such as request for proposals (RFP) need to be rethought. New devices must be invented. And IS leaders need to re-define their role in purchasing.

IS has to take responsibility for making the new IT spending power structure work.

NEW ROLES, NEW RESPONSIBILITIES

First and foremost, IS managers must understand how best to work with their line manager counterparts who may have the "purse" but probably not the skills to determine system requirements, technology options and their cost, and what it takes to successfully negotiate with and manage vendors.

In this new situation, the primary role of the IS organization is to be a purchase advisor and information enabler. This job is much more influential than it initially may sound. By guiding business units through the overall selection process, helping them to identify and articulate their objectives and requirements and matching those requirements to technical specifications, IS can have considerable influence over final decisions, while making itself an invaluable, trusted business partner. Besides exposing potential problems, IS can also do the technical evaluations of products — a key part of the decision-making process.

In this role, IS management provides the "know-how" to build and/or acquire systems that business units then use to create and maintain information which they "own" and for which they are responsible. IS also has critical experience in negotiating license agreements and service contracts and managing outsourcing relationships.

Line managers have two roles: First, to explain how the business processes that underlie the technology work. For example, when customers call requesting proof of delivery on a shipment they claim to have never received, what documents must be tracked? What information delivered? What documents generated? Who is responsible for updating information?

The line manager's other role: to take responsibility for the information which it creates. In the past, IS has tried to control every aspect of the information — sort of "mothering" projects. That's over: Today's successful relationships require IS to relinquish some of this responsibility.

Illustrations by Diane Bigda

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A NEW PURCHASING PROCESS

Question: What do you get from a successful purchasing process? Answer: More than just the right product. A truly successful process also yields win-win selections, enhances the role of the IS organization, puts vendors under close scrutiny, gets the best price point and accurately identifies true ownership costs.

Such a process requires that IS and their line management counterparts work together to develop:

- A short, simple RFP to obtain initial vendor information. Written by IS specialists, this document describes the objectives, budget and requirements defined by the business unit.
- Detailed work scenarios that define specific functions to be demonstrated by the "short-list" vendors' products.
- A set of product demonstration requirements for the finalists, based on the functional requirements in the work scenario.

IS and line managers should review RFP responses together, selecting the top vendors who most meet requirements.

1. THE RFP

I don't have kind words for the typical RFP. Yes, RFPs, if done correctly, have a proper role: They can help the IS/line organization team during the first phase of the search and reduce the initial set of vendors to a short list of two candidates.

But the RFPs I have in mind are short documents. They set out the business objectives and functional requirements defined by the business unit, and the basic technical requirements identified by IS. They're nothing like the huge, bureaucratic documents we've all grown to hate.

In a world where IS and line managers do the shopping together, traditional RFPs are a waste of time (notwithstanding the legal requirement for government agencies and regulated industries).

The traditional RFP, as written by the IS organization, is a detailed description of user requirements, containing a bone-wearying listing of the complete features and functions of the sought-after solution. Each vendor is scored by the features and functions it offers; each feature is weighed differently depending on its relative importance. The weighing reflected the IS organization's interest in technological pyrotechnics more than business objectives.

Vendors and selection committees have gotten very good at getting past this dull drill.

Most vendors have tied an expert system to the word processing software they use to write the documents, so they can quickly generate an astonishing number of "yes" responses to RFP questions. Selection committees use less high-tech methods: If they don't like the outcome, they simply adjust the

scoring system. After all, the weight assigned to each feature is generally decided subjectively.

Traditional RFPs have other flaws. They do not help evaluators assess the vendor's vertical market expertise; nor do they help identify interoperability and customization needs as well as other issues.

That kind of RFP must go. The new RFP, developed by an IS/line organization purchasing partnership, should ask vendors to focus on issues that count in the real world: key functional and technical requirements, cost of ownership, time-to-benefit and return on investment.

To get useful information from vendors, this condensed RFP should provide some background information about the purchasing organization and its requirements, such as:

- The areas of the organization that are targets for automation.
- The business processes slated for new automation (and how they cross lines of business and geography).
- The organization's mandatory requirements (e.g., system must run on the IBM AS/400 platform, be able to support Web-based procurement, integrate with certain databases and run certain reports daily).

The RFP should also ask for these responses:

- How the vendor — and its partners — will meet the outlined information requirements.
- A description of the technical capability of the product, including its potential uses.
- A discussion of how the product can meet integration needs and reporting requirements.
- References from other customers.
- A description of the vendor's vertical industry expertise.
- Identify the vendor's relevant business partners.

IS and line managers should review RFP responses together, selecting the top two or three vendors who most closely meet overall requirements. RFPs should never be the primary vehicle for making a final selection. That is the job of the work scenario.

2. WORK SCENARIOS

Once the 20-odd initial vendors get whittled down by the IT/line search team to two or three candidates, it is time to develop a set of work scenarios. This step is the heart of the software selection process, the point at which good teamwork between IS and line organizations is most critical to the overall success of the purchasing effort.

A work scenario simply sets out a situation that the vendor's software must handle, such as adjusting a price on a purchase order, or handling a customer inquiry (see box above). Work scenarios should be created for as many current and potential business processes as the business unit's requirements dictate. Each is a short document — generally no more than one page — but a powerful one.

These scenarios force vendors to focus on a client's issues as well as the product's strengths. The decision team can see exactly what can be accomplished within a product's

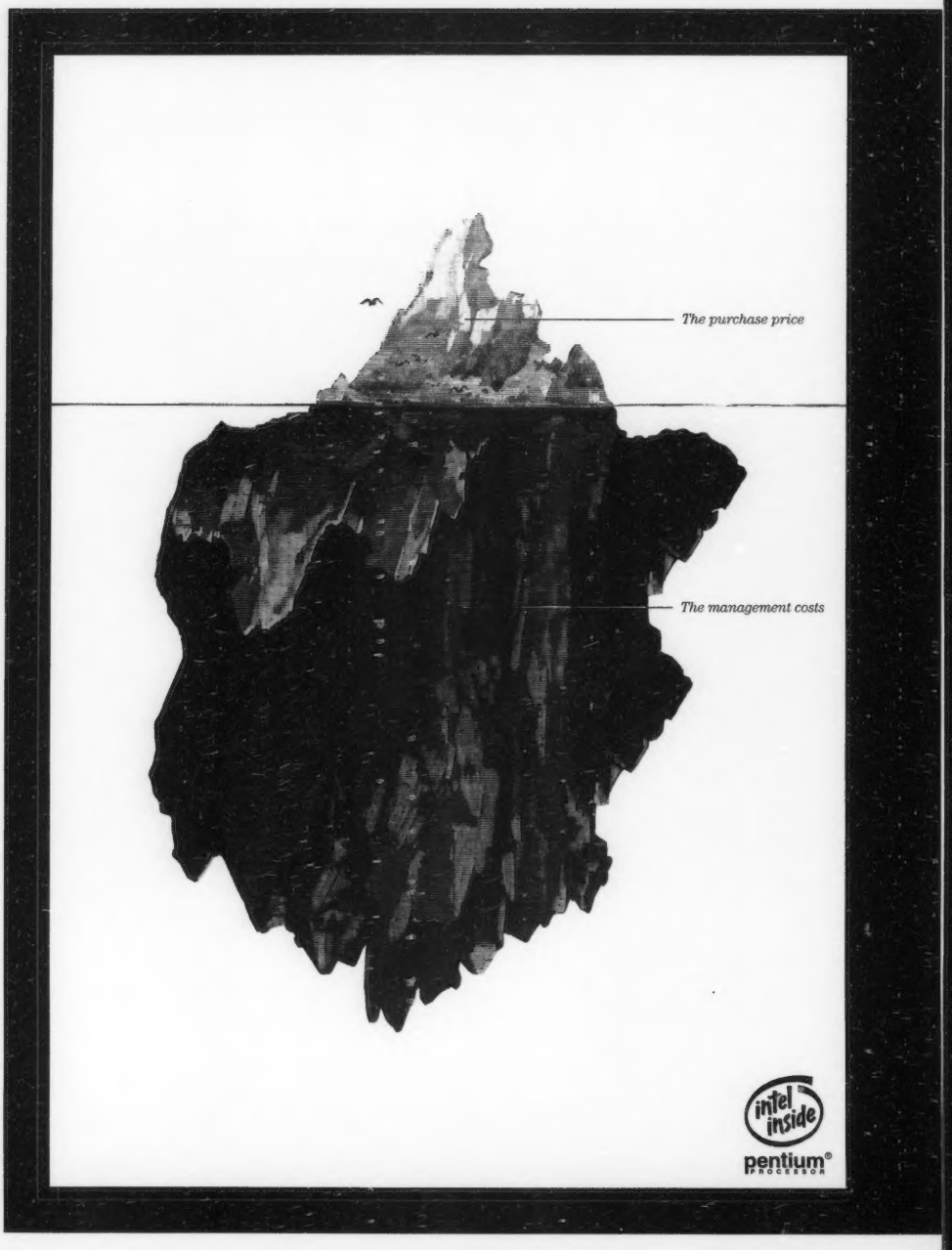
A SAMPLE SCENARIO

What does a work scenario look like? Here's a step-by-step scenario for overriding an incorrect price on an order, based on an actual company that was choosing an ERP software vendor:

A customer has placed an order for 35 cases of an allergy medication at $345 per case, the price normally paid. When the order is entered, however, the database reflects a price of $320 per case.

DEMONSTRATE:

1. The ability of the user to access price information that includes list, cost and discounted.
2. How the user would access the last price paid by the customer for the product.
3. Change the customer price to $320.
4. Show how the system would provide product supplier information such as product code, product description, warranty information and supplier phone, fax and E-mail information.
5. The ability of the system to download product information into other applications.
6. The ability to access supplier Web sites to obtain additional information.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Work flow scripts and demonstrations draw attention away from the flash and glitter of typical presentations and toward how products work.

standard capabilities, and what will have to be customized, by using the work scenario as the framework for the product demonstration and ensuing discussion. If line management helps to develop these precise work flows, IS staff has the detailed understanding of the business processes it needs to get complete answers, both from a business and a technology perspective.

Work scenarios can also help determine the actual value of a software package to the business organization. Application packages often contain much more functionality than users really need. Line management can use scenarios to decide which functions are critical, optional and unnecessary — helping the business organization determine what it is willing to pay.

It takes time to create a work scenario. The IS/line team should spend two to three days actually watching the business unit do its work before it writes one. That's more time than is spent on the typical information interviews, but it's much more effective in determining shortcomings of the current system, identifying opportunities for redesigning business processes and spotting "pain points" — what causes extra work, where duplicate effort is expended, how often procedures are performed. Work flow and business processes are the critical drivers of work scenarios.

There are other benefits of this approach: Work scenarios should uncover critical, but unarticulated, requirements. This process helps better define true cost of ownership since maintenance, customization and enhancements are all identified up front.

All this, of course, puts the user in a good negotiating position.

3. DEMONSTRATING THE SOFTWARE

After the work flow scenarios are written, it's time for the "short-listed" vendors to present product demonstrations based on these work flow

scripts. If the work flow scripts are done correctly, vendors will be forced out of their comfort zone — feature-by-feature comparisons — and obliged to operate on the users' terms. The script draws attention away from the flash and glitter of typical presentations and requires attention to how products work in everyday situations.

One way to manage these demonstrations is to ask the vendor finalists to set up a mini-pilot in a conference room. One week should be allotted (per vendor) for this hands-on testing of the system.

During this process, pay particular attention to any point in the demonstration that doesn't seem to match the work flow script. That's a potential point for customization. Force the vendor to respond in detail as to how the customization will occur. Probing this area is one way IS can bring immense value to the process. Knowing the specifics will help all understand potential implementation delays and incremental costs.

The demonstration phase offers one other benefit: It gives IS an opportunity to assess the skill levels of those using the software and find out what they like and dislike about the software they're using now.

RFPs, work scenarios, demonstrations — there are clear and consistent benefits to having the IS/line team work together, using these techniques, to manage the purchasing effort:

- This process makes users more confident that IS truly understands their issues and requirements.
- The process also enhances IS's credibility, because it gives IS an opportunity to demonstrate its technology expertise within the context of the defined business objectives.
- Vendors are forced to address how the product fits the needs of the potential purchaser.
- All parties have a better understanding of the risks, trade-offs, delays and incremental costs related to any decision.
- The process provides the input needed for contract negotiations for customization projects.

CONCLUSION

Organizations that work together in this way will find themselves in a win-win situation. IS will be viewed as an ally, not as an adversary, and IS professionals will walk away with increased business knowledge. Business unit managers will have a better appreciation of their IS colleagues and their technical expertise and advice. Last but not least, this new IT/line teamwork will better support the needs and objectives of the entire organization.

Not a bad scenario, is it?

ABOUT THE AUTHOR:

Dale Kutnick is the CEO and Research Director of Meta Group, Inc. in Stamford, Conn. Beyond his operational responsibilities, he directs all research and analytic activities. This includes refining the research process, actively working with research groups and managing quality control. Mr. Kutnick is a graduate of Yale University. He can be reached by E-mail via pam.dumas@metagroup.com.

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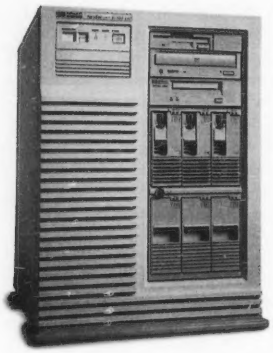

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Give us a wake-up call, already

Michael Cohn

IS is getting boring. These days, there's nothing new. The Internet is old hat. Year 2000 is yesterday's news. DVD and WebTV are yawners.

What we need is some excitement. Some controversy. Some healthy high-tech hype, just like the old days. Remember when folks stood in line all night for Windows 95? Or when IBM gobbled up Lotus? Or when we were overjoyed just to get an AOL disk in the mail, and not just because they threw in 100 free hours and an Easter ham?

What we need is some excitement. Some controversy. Some healthy high-tech hype, just like the old days.

IS needs some big news. We need something to wake us up. We need things such as:

■A Mega-acquisition.

Maybe Larry Ellison or Lou Gerstner could shell out for something. And not just for some sysplex peddler, cable company or a measly football team. Boring! What if some high-tech player took over an airline? An oil company? A burger chain? Now that's news. "As part of our global acquisition strategy, we intend to become the No. 1 provider of extranets, E-mail and electronic commerce! ... And if that fails, would you settle for a Filet O' Fish?"

■A Major Outage.

Nothing spices up IS like a little catastrophe. Let's not get anyone hurt, but what if some Midwestern state's mainframe thought 1997 was 1897 and shut down for a quarter or two? Surely that would get people's attention, unless you happened to be waiting in line for a driver's license at the time and probably never even noticed the difference.

■A Killer Lawsuit.

Somebody sue somebody! It worked for the tobacco companies — look at all the press they got. Is Joe Camel more exciting than Bill Gates? I think not.

"So, Ms. McGillicutty, you blame your husband's unfortunate illness on Excel?"

"Yes, Your Honor. He was up to three macros a day, and it darn near killed him. I'm asking $2 million and that they wipe that Gates fellow's mug off billboards and magazines — he's encouraging spreadsheets among minors."

■New Technology.

Please. No more news about Java. Or 300-MHz chips. Or tiny palmtop operating systems. We need something fresh. Something revolutionary! Remember the sheer excitement of CASE? The near-frenzy created by DB2? The way your heart pounded when you first thought about object-oriented technology?

Maybe not. Actually, my heart still pounds when I think about objects. But that's because, so far, we've forked over $600,000 to eight contractors from Lord knows where who still don't plan to roll out anything until summer 2002.

■Another Snafu.

The only way we seem to make headlines these days is when we screw up. Pentium flaws: big news. Security bugs in Netscape: Stop the presses. So let's hope someone discovers some esoteric error, such as MMX processors skip every other B-flat. Or that 56K modems are really only 55.7K. If we could just reveal that some Pentium IIs occasionally lose $2,800 during random subtraction operations, that might get some attention and possibly save my backside from the heap of trouble I got into with the IRS.

■A Reunion.

If all else fails, maybe we could urge a pair of longtime rivals — you know, two titans who have battled each other for years — to kiss and make up. Imagine the coverage if we could get Bill Gates and Steve Jobs in the same room. Naw, it'll never happen. I'll settle for Tyson and Holyfield and just try to win back my 20 bucks.□

Cohn is a meagerly paid consultant in Atlanta and usually is pretty boring, too.

Survey this!

Brett Arquette

I'm hiding in my office. I've locked the door and told the help desk to screen all calls.

If it's someone doing a survey, the official answer is, "I don't do that anymore." Why? As 33.5% of you already know, if you filled out every survey that hit your desk or came in over the telephone, it would take about 20.06 hours per week.

If information is money, that would explain why 97.2% of everyone in the computer business wants more of it — at my expense.

On average, I must receive at least three requests per week to take a phone survey, and 50% more paper surveys. I've noticed over the past few years that the surveys themselves have gotten 38.2% more involved.

At the beginning of the last phone survey I took, I was assured it would take only five minutes. After 20 minutes, I became really agitated and kept telling the sensitivity-challenged person on the other end that I was done. He kept assuring me that there were only a few questions left — which turned into a few more and a few more. I don't think there was an end to the questions; his job was to keep me on the phone until I hung up in disgust.

Since that time, I accept 100% fewer phone surveys and do 98% fewer mail surveys. But I can't walk away completely. For some bizarre reason, I find I'm 27.3% more prone to do mail surveys if the surveyors simply insert a dollar.

Don't ask me why. It's not as if a single simoleon is going to pay for the time it takes to fill out eight or 10 pages of questions. It's more a feeling that the people on the other end have acknowledged in a simple way that my time is worth something.

In fact, I could see myself becoming a full-fledged survey-filling-out junkie if they put in $50 instead of $1. I have no pride. Well, 22.9% less than last year, anyway.

So I have a few questions for all you survey companies that call me while my mail server is on fire. Don't worry, it'll take only five minutes. In fact, I'll supply the answers.

Q: Do surveys matter to me?

A: Not really. Just because 62.5% of everyone else uses some hardware or software, it doesn't mean it will be right for my needs or that it will be in my price range.

If you filled out every survey that hit your desk, it would take 20.06 hours per week.

Q: How many companies want me to fill out a survey?

A: 400% more than five years ago.

Q: What happens to all the answers I give, and what mailing list do I end up on?

A: You put me on 2% more mailing lists for every answer I fill in.

Q: How many corporate and government IS hours are wasted per year filling out surveys?

A: 5% of the GNP.

Q: Why don't you just survey the companies that sell this stuff?

A: They already know how many boxes they sell and to whom.

I'm sure that surveys are important to someone for some reason. Therefore, I'm going to post a single survey response on my organization's home page. When someone calls, I'll direct them there, and they can get the information on their own time.

Research shows I can increase my hit rate 10% to 15% that way.□

Arquette is manager of information systems at the 9th Judicial Circuit Court in Orlando, Fla. His E-mail address is barq@iag.net.

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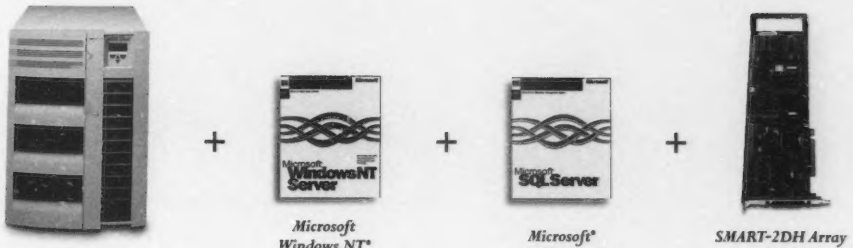

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1997 TOP 10 RETURNS ON INVESTMENT

What projects returned a positive return on investment for IT?

Server consolidation	67%
Network integration	62%
EDI	59%
Mainframe consolidation	58%
Legacy system integration	56%
Bipolar-to-CMOS conversion	53%
Systems management tools	48%
Re-engineering	48%
Network management tools	47%
Data warehouse	44%

Base: 500 senior IS managers and CIOs

Source: Computer Economics, Inc., Carlsbad, Calif.

Y2K services surge

Demand for year 2000 services will prompt gargantuan growth, according to a study by Killen & Associates in Palo Alto, Calif. From this year to 2002, the demand for year 2000 systems integration, professional services and outsourcing will reach $145 billion in North America. About $10 billion has been spent so far. Worldwide spending on year 2000 fixes is expected to reach $280 billion during that period, according to the study.

IMR wins contracts

Sony Europe Finance PLC, a financial management unit of the electronics giant's European operations, awarded Information Management Resources, Inc. (IMR) a year 2000-compliance project. Clearwater, Fla.-based IMR also recently received a $10 million contract to convert approximately 9.2 million lines of mainframe code for the Australian Mutual Provident Society, a financial services company in Sydney, Australia.

Corporate strategist: Scott Barrett

By Thomas Hoffman

MOST CHIEF INFORMATION officers have to slog through only one or two major acquisitions in their careers.

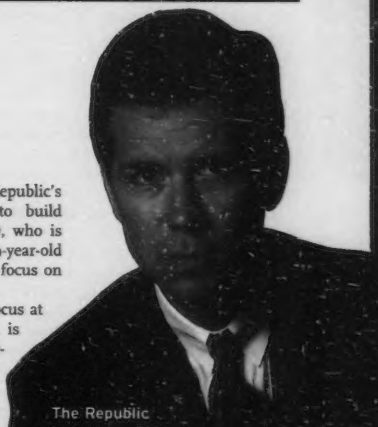
Not so for Scott Barrett. He is responsible for orchestrating systems integration among the 127 new-car dealerships nationwide that Republic Industries, Inc. acquired during the past year, and that doesn't include the company's expansion into the car-rental, waste management and security businesses.

Barrett, 36, thought he had witnessed "explosive" growth at Blockbuster Entertainment Group when the video retail giant was adding a new store every 16 hours to its 4,000-store franchise during the height of his eight-year tenure as CIO and later as operations chief at the Fort Lauderdale, Fla.-based company.

Compared with Republic, also based in Fort Lauderdale, Blockbuster's growth "was mild-mannered," said Barrett, a rather mild-mannered fellow himself who enjoys woodworking and fly-fishing when he isn't guiding one of Republic's megadeals. "I like to build things," said the CIO, who is married and has a 9-year-old son. "It allows you to focus on the task at hand."

He will need that focus at Republic, where he is centralizing management of the company's telecommunications and operations areas. Barrett is also examining a shared-services infor-

Corporate strategist, page 38



The Republic Industries CIO says he likes "to build things"

Paying for year 2000 repairs

▸ *Vendors could be held responsible*

By Jaikumar Vijayan

READ THE FINE PRINT. It could save you some money in year 2000 conversion work.

That's the advice experts have for corporations that have outsourcing agreements with vendors that go back a few years.

In some instances, at least, experts said, outsourcing and other third-party vendors could be required to undertake year 2000-compliance work — and fix it at their own cost — as part of the services they agreed to do for customers.

Getting vendors to agree to and actually shoulder all the year 2000 repair costs could prove formidable, but companies should at least request in writing that their outsourcing vendors do so, observers said.

Although such cases haven't reached the courts yet, conflicts over who is liable in year 2000 conversion work — user com-

Paying, page 38

Office politics at Office Depot

By Julia King

SUCCESSFULLY implementing new technology at a big company takes time and money, of course. But it also requires a good deal of political will.

Just ask Michelle Sonder, a training technology developer at Office Depot, Inc., the office supply retail chain.

In 1995, Sonder and her team began researching technologies that could reduce the cost of training employees in California and Texas and at company headquarters in Delray Beach, Fla. Office Depot was spending thousands of dollars per week flying staffers around to train workers on its proprietary order-entry system. It was spending even more money training workers in packaged business applications such as Microsoft Office at off-site training centers.

JEFFREY SALTER/IDG

Office Depot's Michelle Sonder says it was a battle to get a training system implemented companywide

First the team tried CD-ROM-based courseware, but "it failed miserably," Sonder said, because users were accustomed to classroom learning. That preference also spelled doom for a brief look at satellite broadcasts.

In October 1995, Sonder's team signed a contract for an interactive "virtual classroom" system from Troy, N.Y.-based Interactive Learning International Corp.

The LearnLinc system, which incorporates videoconferencing and multicasting technology, would operate over the company's wide-area network. That would enable users in remote locations to watch an instructor online via video while practicing at their individual desktops.

But the information systems department balked. "We were told we needed to create our own network to connect to the different locations," Sonder said.

The reason: The existing network access lines to the remote sites were only 56K bit/sec., but the new training system required 512K bit/sec. lines, said Joe Brink, director of network services at Office Depot.

On the political front, Sonder said, IS also didn't take kindly to the training department hiring its own network technician,

Office politics, page 38

Paying for year 2000 repairs

CONTINUED FROM PAGE 37

panies or contracted service providers — are expected to make up a portion of a litigation flood as 2000 draws closer, observers said.

Dan Mummery, a partner at New York law firm Millbank, Tweed, Hadley & McCloy, said user companies must do advance work to protect their interests.

Not doing the legal groundwork is a potential hazard. Corporations could risk waiving their rights later to seek reimbursement for money spent fixing a year 2000 problem, said Jeff Jinnett, a lawyer at LeBouef, Lamb, Greene & Mackae in New York.

Such issues could become increasingly important for companies concerned about the costs of year 2000 conversions and their exposure to potential litigation.

"It is a very gray area; nobody has ever litigated over this so far. But if the client has a strong case, they will be able to at least partly 'off-lay' the costs" involved in the conversion, Jinnett said.

That's because in some cases, year 2000 conversion work could fall under the provisions contained in a standard maintenance contract, observers said.

SMALLER IS BETTER

Under a software maintenance contract, a vendor typically agrees to handle preventive and corrective support of all software defects and failures related to systems and third-party software under maintenance. Year 2000 conversion could fall under that category, depending on the pricing of the contract and the language of the agreement negotiated between the vendor and outsourcing company, some observers said.

"The smaller the cost [of doing the conversion], the more likely it is that you can force the vendor to do the job themselves" rather than pursue litigation, Jinnett said. "But if the cost is really large, they may just end up saying, 'This doesn't make any sense for us.'"

Most newer contracts, such as the one Trigon Blue Cross/Blue Shield in Richmond, Va., has with its outsourcing vendor, clearly define areas of responsibility for year 2000 work.

"Trigon bears the bulk of the responsibility [for year 2000 work], since we are building the baseline test beds" against which all the applications will be tested for year 2000 compliance, said Dan Clark, director of applications services at Trigon.

Though the actual renovation work is being done by New York-based system integrator Cap Gemini America, Trigon is responsible for crucial tasks such as identifying all the affected date fields.

But older outsourcing contracts signed before the year 2000 bug gained public attention seldom made those kinds of provisions for handling year 2000 work. As a result, assigning responsibility to a vendor could be hard to prove.

"Obviously, legal issues are something that people resort to when everything fails. But I am not so naive not to believe that sometimes that may be the only way" to resolve disputes that arise out of the year 2000 issue, said Chad Willis, a senior analyst at the Salt River Project and president of the Arizona Millenium Group in Phoenix.

"It is a fairly tough negotiation because each one of these contracts will also have limitations on [a vendor's] liabilities," Mummery said. "A lot depends on what other work you are able to bundle on top of what you already have with the vendor, as a hook for doing the job," he said. □

YEAR 2000 TIPS FROM THE EXPERTS

- Locate and review license and long-term maintenance agreements that relate to third-party licensed software.
- Review all data processing outsourcing agreements to determine if the outsourcing vendors can undertake year 2000 repair work.
- Examine any provisions in the systems software maintenance part of an outsourcing agreement.

Source: www.comlinks.com/legal/jjint.htm

& IS needs to prepare for potential year 2000 lawsuits. Page 76

Corporate strategist

CONTINUED FROM PAGE 37

mation systems delivery model in which the IS group may team with corporate departments such as payroll and claims processing to deliver services to business units.

Under its acquisitive-minded CEO, H. Wayne Huizenga, Republic has skyrocketed from a $100 million also-ran to a $10 billion juggernaut in less than two years. In addition to its AutoNation used-car franchise, Republic's holdings include National Car Rental System, Inc., Alamo Rent A Car, Inc., and Spirit Rent-A-Car.

Enter Barrett, a longtime lieutenant under Huizenga who took the reins of Republic's technology department just two months ago. While he has been bringing himself up to speed in Republic's four primary businesses, Barrett has been plotting an information technology strategy to help Republic cut costs and improve the way its companies do business.

For example, because most of Republic's smaller dealerships have low telecommunications expenditures, they usually pay top dollar for local and long-distance services, Barrett said.

By centralizing Republic's telecommunications support from dozens of third-tier carriers to two national carriers (one serving as a backup carrier), Barrett said he hopes to slash the company's telecommunications expenses in half. A backup "provides a challenging environment" for a lead vendor to "look over its shoulder at [competitive] rates and new technologies," he said.

Integrating Republic's new-car dealerships might not be as complicated as it looks. Most rely on dealership systems from two primary vendors — The Reynolds & Reynolds Co. in Dayton, Ohio, and Automatic Data Processing in Roseland, N.J., which is typical of the automobile dealership industry.

OVERCOMING A BARRIER

There is a "large barrier for entry" into this market, Barrett said, because the systems used by car dealers have to be approved by and integrated with the world's 30 largest automobile manufacturers. So Barrett is evaluating the strengths of each company and intends to select a single partner by the end of the year to improve IT support to the dealerships and simplify contract management.

Republic would face even greater challenges if it decided not to integrate its far-flung dealerships, one industry analyst said. "Companies that integrate see themselves more clearly and can act as one company better than those who do not," said Christine Ferrusi Ross, an analyst at Dataquest Worldwide Services Group in Westboro, Mass.

Although she views Barrett's role as a "tremendous" challenge given Republic's size, Ferrusi Ross said Barrett can use integration to his advantage by applying the best practices of each dealership and standardizing those processes "across the board."

In the long term, Barrett said, he is eyeing the potential that electronic commerce can deliver to Republic's dealerships and car rental agencies. With the exception of Alamo's World Wide Web site, which has online reservations (*www.goalamo.com*), most of the company's sites are marketing-oriented, Barrett said.

Barrett said he would like to formulate an electronic-commerce strategy that allows car buyers to use the Internet to shop for a car, make comparisons, purchase a vehicle and have it delivered.

"I think it's going to be a huge opportunity for us to step into that arena," said Barrett, who figures it will take consumers a year or two to abandon the need to "touch" a car before signing on the digital dotted line. □

Office politics

CONTINUED FROM PAGE 37

even though IS had already said it couldn't support the system.

A third problem was that LearnLinc runs on Windows 95, and Office Depot's corporate standard is Microsoft Corp.'s Workgroup for Windows.

Meanwhile, the clock was ticking. It had been three months since Office Depot had purchased the LearnLinc software license. And Sonder had her own reasons for pushing the project along.

"With a new technology like this, you have to prove it right away, or chances are you're going to fade into the woodwork," she said.

BACK THROUGH CHANNELS

Sonder figured that her best bet was to work her way back through the executive channel, because CEO Dave Fuente had signed the $150,000 capital asset request for the hardware and software.

Her strategy worked. A deal was worked out through Fuente and a former senior IS official: IS would support the training system's network, and a network technician within the training department would provide all desktop support.

"But I don't want to play it off like it was an easy thing," Sonder said. "There was a lot of political posturing. IS didn't want us to have an IS person on the training payroll, but they also couldn't support us to get the project off the ground."

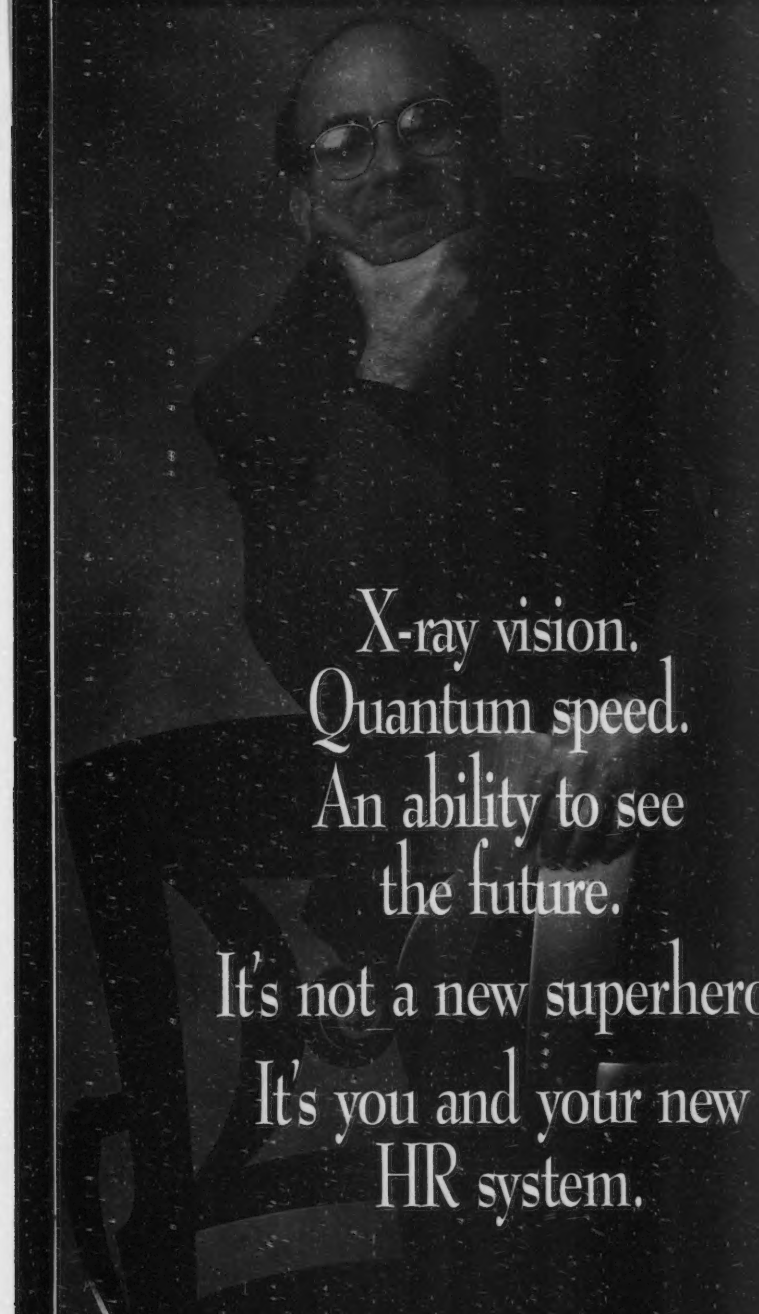
Sonder's experience isn't that unusual. Political battles between IS organizations and other departments, such as training and human resources, are typical, said Susan J. Goldberg, president of Northeast Training Group, Inc., an IS training consultancy in Newton, Mass.

The battles "often have to do with IS being responsible for technical training and HR having responsibility for soft skills," Goldberg said.

Now running a little more than a year, LearnLinc has reduced training and travel costs by hundreds of thousands of dollars. Sonder said Office Depot saved $40,000 in a week by having a vendor deliver software training on Office Depot's internal system rather than delivering in-person training to users at its three sites.

Kevin Wolf, an inventory manager, is among the 1,200 users who has been trained since last May. It offered him the chance to meet several remote colleagues via video, he said. □

HR MANAGEMENT SYSTEMS



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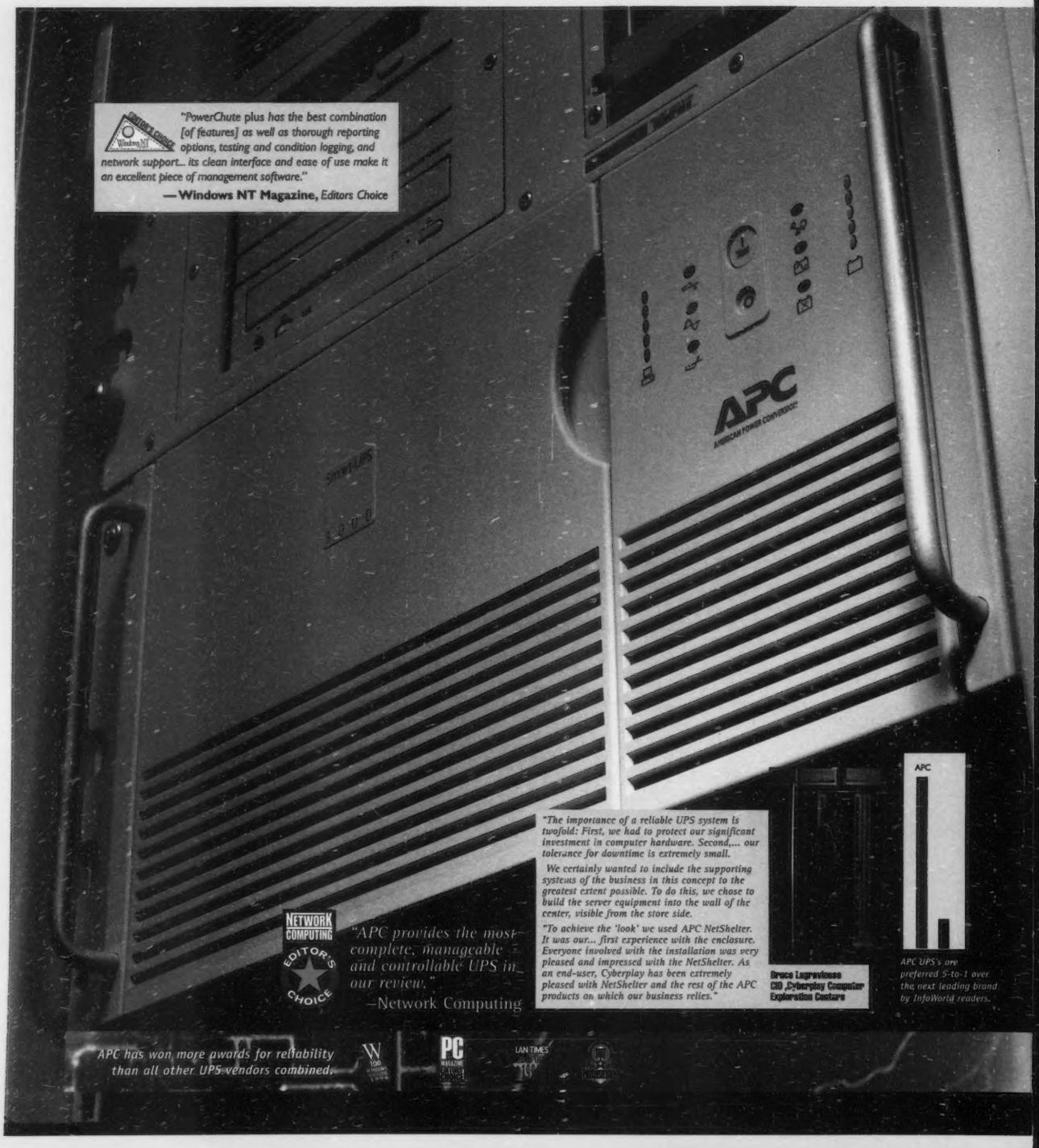

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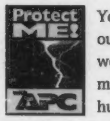

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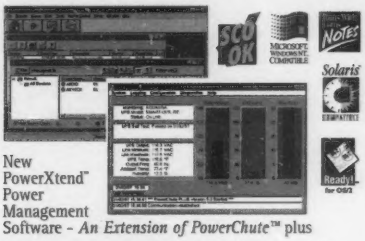

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Briefs

E-commerce apps

Intel Corp. and SAP America, Inc. have formed a joint electronic-commerce company called Pandesic LLC. The companies plan to offer packaged services for selling over the Internet. Hewlett-Packard Co. and Compaq Computer Corp. will sell Intel-based servers to run preloaded software, dubbed the Pandesic Internet Business Solution.

BackOffice sample kits

Microsoft Corp. last week released its Intranet Kit and Microsoft Commerce Kit. The kits include trial software for BackOffice products to let businesses build and enhance corporate intranets or World Wide Web sites for electronic commerce. The kits cost $14.95, plus shipping and handling.

Traders get 'net boost

U.S. Clearing Corp., a New York-based clearinghouse for brokerages and banks, has launched Internet securities trading systems for three clients — Professional Discount Securities, a division of Thomas F. White, Inc. in San Francisco (*www.1800stocks.com*); First Flushing Securities, Inc. in Flushing, N.Y. (*www.firstflushing.com*); and Newport Discount Brokerage, Inc. in Boca Raton, Fla. (*www.newport-discount.com*)

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(1 is not important; 5 is critical)

Messaging	4.1
Document management	3.5
Calendaring and scheduling	3.5
Internet, Web	3.4
Workflow	3.0
Imaging	2.7
Real-time conferencing	2.3

Base: 500 IS and business line managers
Source: International Data Corp., Framingham, Mass.

Supply closet hits the Web

Boise Cascade's Laura Longcore said Web sales save the vendor 45 cents per item

BLACK/STAR

▶ *Office supply giants use extranets for orders*

By Mitch Wagner

OFFICE DEPOT, Inc. and Boise Cascade Office Products Co., two giants in the office-supply industry, are turning the Internet into the world's biggest supply closet, where users can go to fill orders for legal pads, paper clips and stamp moisteners.

The two competing companies have each launched extranets designed to help corporate customers buy office supplies online — saving time and money for both user and supplier.

The extranets expand the electronic-commerce universe for the two companies, which have long conducted business using electronic data interchange (EDI). EDI requires private network connections and is less flexible than the Internet. Boise Cascade plans to mix the two, adding Internet flexibility to the rich database connectivity of EDI.

Boise Cascade, in Itasca, Ill.

Office supply, page 46

REVIEW▶ *City Web guides*

Boston guides capture city's essence

By Laura Hunt

CITY GUIDES EMBODY the best the World Wide Web can offer. They gather in one place all the information available about a city, can help you plan a weekend trip, find concerts and events, locate a restaurant near the theater or give you picks for flicks. They can even help you move.

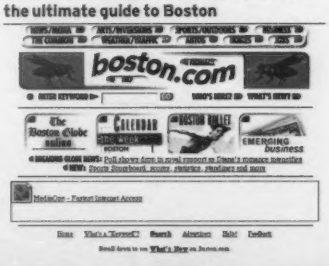
Boston provides a good reviewing ground for these sites, because *The Boston Globe*'s site, Boston.com, was launched in 1995, making it one of the first Web-based city guides. The field has grown since then and now includes local entries from national programs by Microsoft Corp., America Online, Inc. and Yahoo, Inc.

The regional guides either are entirely link-based or hire staff to create original content in addition to providing links to other sources, such as newspaper content published online.

The companies that produce these city guides are banking on

Boston, page 48

Boston.com uses partnerships to create the ultimate guide to Boston



AUTHENTICATION

Banks report to states via E-mail link

By Sharon Machlis

LOOKING TO GET their feet wet with current user authentication technology, Massachusetts IS officials next month plan to roll out a pilot project so banks can use digital certificates to communicate by electronic-mail with state regulators.

"It's a pathbreaking application," said T. Louis Gutierrez, chief information officer for the commonwealth of Massachusetts.

Participating banks will use certificates issued by GTE CyberTrust in Needham, Mass., to certify the authenticity of weekly interest-rate reports before sending them over the 'net. Those reports are currently sent by fax, requiring state workers to input the data by hand.

"Sometimes bank examiners are typing this stuff in. It's a real waste of time," said Daniel Greenwood, deputy general counsel at the Massachusetts information technology division.

Banks, page 46

Microsoft, MCI champion 'net video technology

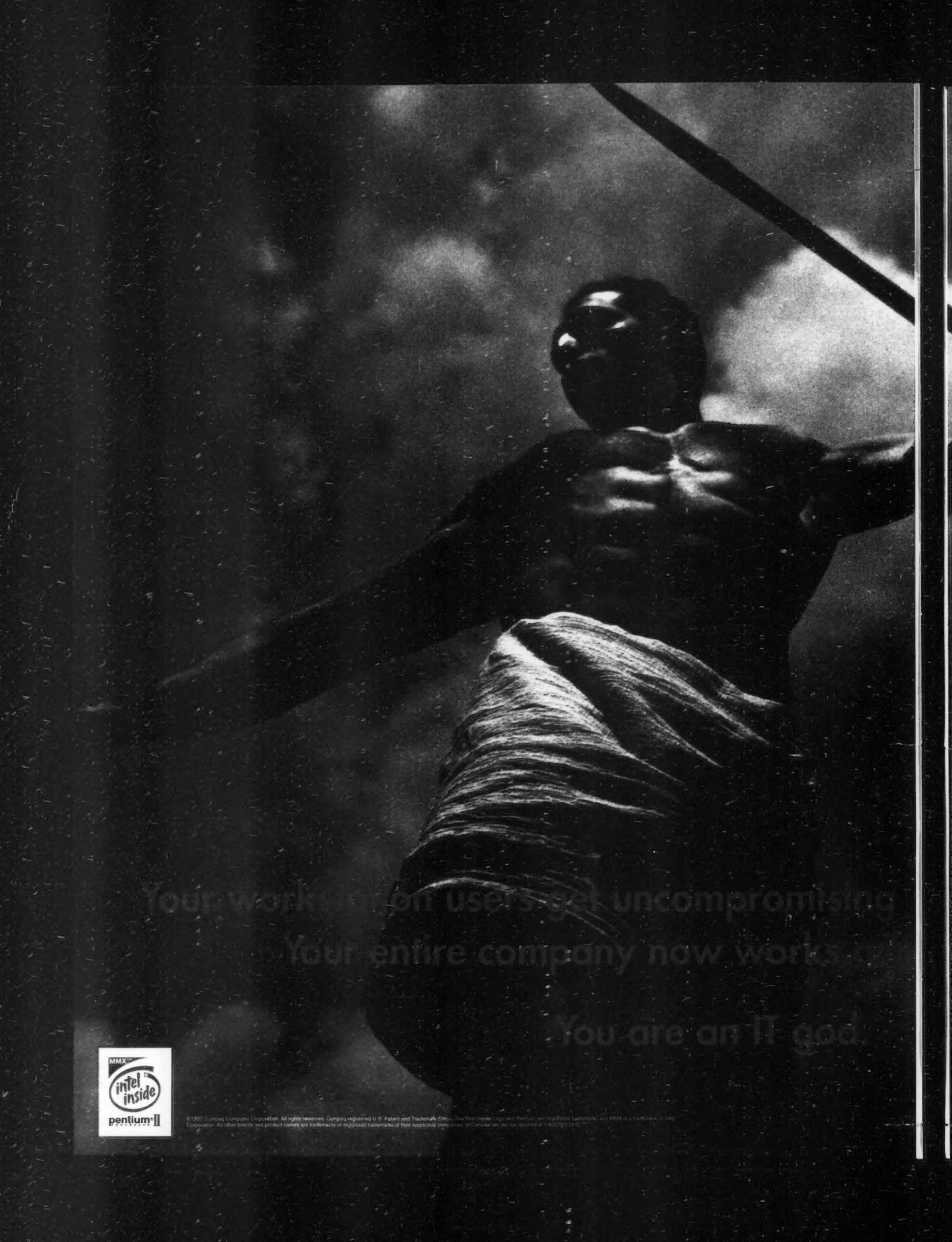
By Mitch Wagner

MOVES BY Microsoft Corp. and MCI Communications Corp. this month to embrace video on the Internet could help boost the technology from plaything to mainstream.

"Acceptance of Internet video is already moving pretty fast, and this will just speed up the process," said Tod Fetherling, director of interactive marketing at Columbia/HCA Healthcare Corp. in Nashville.

The company uses Internet video to carry "Grand Rounds," morning conferences among physicians at different hospitals and health institutions.

Internet video, page 46



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Internet video gains respect

CONTINUED FROM PAGE 43

Last week, Microsoft announced plans to buy VXtreme, Inc., a 90-person Internet video vendor in Sunnyvale, Calif. And MCI said it will add servers to its network to provide greater throughput for RealMedia audio and video from Progressive Networks, Inc. in Seattle.

The Microsoft and MCI efforts, combined with other developments in recent weeks, indicate that the long-prophesied convergence of the Internet and video may finally be taking hold, experts said.

Video on the Internet has long been seen as a toy — good for concert clips and sports footage but not much else.

But companies are starting to adopt it for more serious uses, such as videoconferencing or adding marketing and sales information to World Wide Web sites.

Developments such as WebTV from WebTV Networks, Inc. promise to bring Internet capabilities to television — meaning companies will have a much broader channel to reach out to consumers through the Internet.

"I look at the convergence of the Internet and television as being something that's two to three years out," said Richard Wolpert, executive vice president at Disney Online in North Hollywood, Calif. "But it's one of my most important responsibilities to look that far out. If we wait until the technology hits the mainstream, it'll be too late. We won't be able to compete."

One of the technologies Disney Online is examining is Intercast, championed by Intel Corp. Intercast permits users to download Web documents over unused bandwidth on conventional cable television signals, Wolpert said. Viewers may one day be treated to Hypertext Markup Language advertisements running down one side of the television screen as their favorite shows from the ABC network — owned by The Walt Disney Co. — plays on the other side, he said.

Microsoft is moving into internet video by:

- Buying VXtreme to access its engineering staff and video broadcasting technology.
- Acquiring WebTV Networks for $425M, a maker of set-top boxes that convert TVs into primitive computers.
- Making a joint marketing and technology deal with VDOnet to license VDOnet's video technology.
- Forging a deal with Progressive Networks to make Microsoft and Progressive technologies interoperable.

MICROSOFT MOVES

Microsoft is maneuvering itself to be in the center of the future of Internet video, said Rob Enderle, an analyst at Giga Information Group in Santa Clara, Calif.

In addition to the VXtreme acquisition, Microsoft earlier this month completed its $425 million acquisition of WebTV Networks. The Palo Alto, Calif., company makes set-top boxes that convert televisions into primitive computers capable of viewing Web pages and sending and receiving electronic mail. Microsoft also has licensed video technology from VDOnet Corp. in Cambridge, Mass., and has cut a deal with Progressive Networks to make Microsoft and Progressive technologies interoperable. It will use VDOnet's technology for videoconferencing.

But video on the Internet still faces major hurdles. The biggest: Low bandwidth, combined with low computing power on desktop machines, means that videos are still grainy and jerky, despite improvements over the last year, said Columbia Healthcare's Fetherling. □

Office supply giants use extranets for ordering

CONTINUED FROM PAGE 43

is fast out of the gate, with 650 corporate customers that use its system, called 197. Meanwhile, Office Depot, in Delray Beach, Fla., is moving slower, with only a few dozen companies that buy over the Internet. Both companies have been trading on the Internet since last year.

Boise Cascade expects to generate 3% of its $2.5 billion office-supply revenue on the Internet this year, said Laura Longcore, marketing systems manager at Boise Cascade. The firm will convert existing customers and existing revenue to the Internet and expects to save 45 cents per line item on each Internet purchase by reducing handling and paperwork, Longcore said.

The company uses electronic commerce servers from Actra Business Systems LLC in Mountain View, Calif., a joint venture of Netscape Communications Corp. and General Electric Information Services. The Actra servers provide EDI transactions over the Internet.

The mixture of products will let customers' purchasing departments control what individual employees can buy and who needs to approve each order.

"That's the crucial difference between business-to-business vs. business-to-consumer electronic commerce," Longcore said. "Businesses want to control who's ordering what and what they're allowed to order — they don't want to go through Boise for that control. On the business-to-consumer side, anyone with a credit card can purchase anything. But for business-to-business, there needs to be rules."

"Buying over the Internet is very simple. They've made it easy," said Boise Cascade customer Dana Clapper, a buyer at Fujitsu Business Communications Systems, Inc. in Anaheim, Calif.

Previously, ordering office supplies required Clapper to look up parts numbers, customer numbers and special pricing in separate documents, then fax the order to Boise Cascade after an internal review process by Fujitsu executives. Supplies were delivered in three to five days. Over the Internet, the information is supplied automatically, reviews are built in to the software and the order is delivered overnight.

FEWER ERRORS

"When you file an order in EDI, there could be errors in it, and you don't find out until the order gets kicked back to you. That's generally a day," said Paul Gaffney, senior vice president of systems development at Office Depot. "On the Internet, that checking is immediate."

Office Depot is building its Internet-based electronic commerce solution in-house. The company started early last year with just one customer, MIT in Cambridge, Mass. The company has moved slowly in its online effort because it wants to be methodical and make sure the system works perfectly before deploying it on a large scale, Gaffney said.

Office supply ordering is a good place for businesses to get started in electronic commerce, said Peter Roden, a partner at SupplyWorks, Inc., an Internet commerce consultancy in Lexington, Mass. "The risk is pretty minimal. You're buying a box of paper clips as opposed to buying something that's high value or high secrecy to it," said Roden, who was a project manager at MIT when the university did its procurement deal with Office Depot. □

Banks, state link via E-mail

CONTINUED FROM PAGE 43

For now, the scale of the project is small — only about a dozen institutions will beta-test — so initial savings would be low. But if it is successful, Gutierrez said, he hopes the state will be able to scale up the technology across many different agencies and applications, possibly allowing the hundreds of vendors that deal with the state to send invoices and payments electronically. "There are great fields of opportunity," Gutierrez said.

The project may be expanded to bigger, more important bank records, such as quarterly financial reports that now arrive on paper. That carries more risk but also the potential for more savings, Greenwood said.

"We are trying to find early applications that work ... and then scale up to our enterprise. We are expecting very significant time savings and cost savings," he said. "We are still in the exploratory phase."

SHARON MACHLIS

Massachusetts' T. Louis Gutierrez: E-mail project the first step in linking state to users

Massachusetts officials have tested some Internet service programs that require confidentiality but not user authentication. For example, residents can renew their vehicle registrations and pay civil traffic citations online with a credit card.

Those applications need to be protected from eavesdroppers, which is why they are using Secure Socket Layer encrypted connection. But state officials were less concerned that someone would try to assume the identity of another person in order to pay for their license plates or fines. Registration and traffic citation data aren't available online.

Massachusetts is "among the first handful and perhaps the very first" in state government to use digital certificates for authenticating financial data, said Jerry Mechling, director of the Strategic Computing in the Public Sector program at Harvard University.

Digital certificates haven't yet moved into the mainstream of state and local government, in part because the technology and infrastructure are relatively new. Government officials don't want to pick a standard and an issuing authority only to find themselves isolated from transactions elsewhere in government and the private sector. State IS officials will meet later this year to work out Internet authentication standards, Gutierrez said.

At the federal level, the Department of the Treasury has launched a test with MasterCard International, Inc., Mellon Bank Corp. and GTE CyberTrust that lets participants buy U.S. savings bonds and surplus goods.

Massachusetts officials said posting government services on the Internet will also save taxpayers the hassle of going to a state office. "When we figure out how to do authenticated filings [over the Internet], that's going to be a good day for citizens and businesses in the commonwealth," Greenwood said. "We believe the citizens would rather be online than in line." □

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WEB REVIEW ▶ *City Web guides*

Boston guides capture city's essence

CONTINUED FROM PAGE 43

the future profitability of the Web. Besides advertising, they offer a convenient way to point, click and buy items such as concert tickets. None of the sites here offers direct access to these services yet, and the outcome of a legal fight between Ticketmaster Corp. and Microsoft over control of links could limit ticket sales and other services [CW, May 5].

With that in mind, let's go to Boston!

BOSTON.COM

The ultimate guide to Boston, Boston.com provides news and event information from *The Boston Globe* and content from its 35 media partners — including newspapers, magazines and radio and television stations. It offers reviews, maps, traffic and weather information, real estate listings and school information — it is everything a guide should be.

Boston.com has used partnerships to create the most diverse, useful and comprehensive regional guide in New England. It truly captures Boston's arts, culture and nature. The editorial content is well done (in addition to its media partners, Boston.com employs its own staff of 30), is easy to use and navigate and offers many features that will continue to set it apart from other Boston sites.

One of the most-visited features on the site charts the progress of Boston's Central Artery Tunnel Project, the nation's biggest public works effort designed to ease inner-city traffic. It gives alternate traffic routes, progress reports and information on contracts awarded to companies involved in tunnel construction. That kind of "Boston-only" content makes Boston.com the one to beat for regional guides.

The Boston Phoenix's site offers the best entertainment coverage in the area

BOSTON SIDEWALK

With a stellar editorial staff, original Boston-flavored content and a slick, easy-to-use interface, Microsoft's Boston Sidewalk is an admirable new entrant to the Boston city guide scene. The database of events and information is huge, searchable and updated often. The events and restaurant guides are a combination of listings, reviews and feature stories, which all convey a feeling of Boston.

A customization feature that lets you set a profile of musical tastes, cuisines, sports and other activities is great; you can see events in those categories for the week, or receive weekly electronic-mail updates. The ability to search by time period, such as what is happening this weekend, is one of the best features of the site.

The lack of weather reports, traffic and local news keeps Boston Sidewalk from overtaking Boston.com. But with the dollars Microsoft seems willing to spend, Sidewalk will be a contender.

DIGITAL CITY BOSTON

AOL's Digital City sites are primarily links to other sites, although some original content can be found in the "Critic's Picks" and "On the Town" sections.

The Boston site doesn't have the feel of the city experienced in the Microsoft or Boston.com sites, and it was difficult to use. To get to the Boston site, you have to click on a map of the world, and move from there. Getting to information about a specific event using the menus is almost impossible.

Because the site is link-based, ease of use should be a top priority. Unless event coverage is added along with reviews and other editorial content, Digital City Boston won't be the "one-stop center for entertainment, business, sports and news" that its founders claimed.

On the plus side, I found the "Wicked Good Guide to Boston English" and a sarcastic site called "The Worst of Boston," which "collects the bad drinking and eating establishments in Boston." Access to fun, odd sites is one advantage of the link approach.

On AOL, the site includes local news items and links to more local events, weather and shopping.

YAHOO BOSTON

This is the best of the linked sites, as it is content-rich and offers the easy navigation of the popular Yahoo search engine.

The links are incredibly comprehensive and up to date. A music search yielded events, calendars, performance venues, musical organizations and links to 324 Boston-area artists' Web pages. The site also uses Yahoo's excellent mapping, yellow pages and chat functions.

Although it doesn't offer the editorial scope of Sidewalk or Boston.com, Yahoo Boston is easy to understand and offers useful, relevant links. If you don't have a local guide like Boston.com in your town or aren't on Microsoft's list of Sidewalk sites, check out Yahoo's Metros guides, or Yahoo Get Local, which are accessible by ZIP code.

THE BOSTON PHOENIX

This site is offered by *The Boston Phoenix*, the city's alternative weekly newspaper. Although the site doesn't provide weather or other nonentertainment information, *Phoenix* coverage of entertainment is the best in Boston, with the most listings, reviews and links to a wide variety of other guides, museums, libraries and performance locations. A searchable database and excellent interface make the site easy and pleasant to use.

The site reviews the best-known and lesser-known Boston eateries. It also offers access to the print edition's "On the Cheap" section, which offers reviews and information about Boston's least-expensive restaurants.

The focus on off-beat inclusiveness found in the food and music guides can also be found in *Phoenix* feature articles on local issues and personalities, and book, theater and movie reviews. This well-designed site is an excellent example of how the Web can be used to deliver content in an engaging manner and offer the user more than a print version. □

HOW THEY STACK UP

	Performance	Ease of use	Content scope	Customization	Overall grade
Boston.com *www.boston.com*	A	A	A	No	A
Boston Sidewalk *http://boston.sidewalk.com*	A-	A-	A	Yes	A-
Digital City Boston WebGuide *http://boston.digitalcity.com*	A-	C	C	No	C
Yahoo Boston *http://boston.yahoo.com*	B+	B+	A	No	B+
The Boston Phoenix *www.bostonphoenix.com*	A	A-	A	No	A

Advertising shift

Why invest in these types of sites? Consider these numbers being bandied about by pundits, analysts and advertising experts: Forrester Research, Inc. in Cambridge, Mass., estimates that advertisers spend $60 billion to $80 billion in local advertising markets; these advertisers will shift $1.5 billion from newspapers and other traditional media to Web ads by 2001. Microsoft expects local directory advertising (such as restaurants) to make up 70% of Sidewalk revenue. The Boston.com site is visited by 40,000 to 50,000 people per day; Digital City Boston claims 500,000 visits per month. Because those visitors are focused on spending time and money in the locality served, advertisers can be more assured of being viewed, and used, than if they had spent their Web ad dollars in a less-focused arena.

— Laura Hunt

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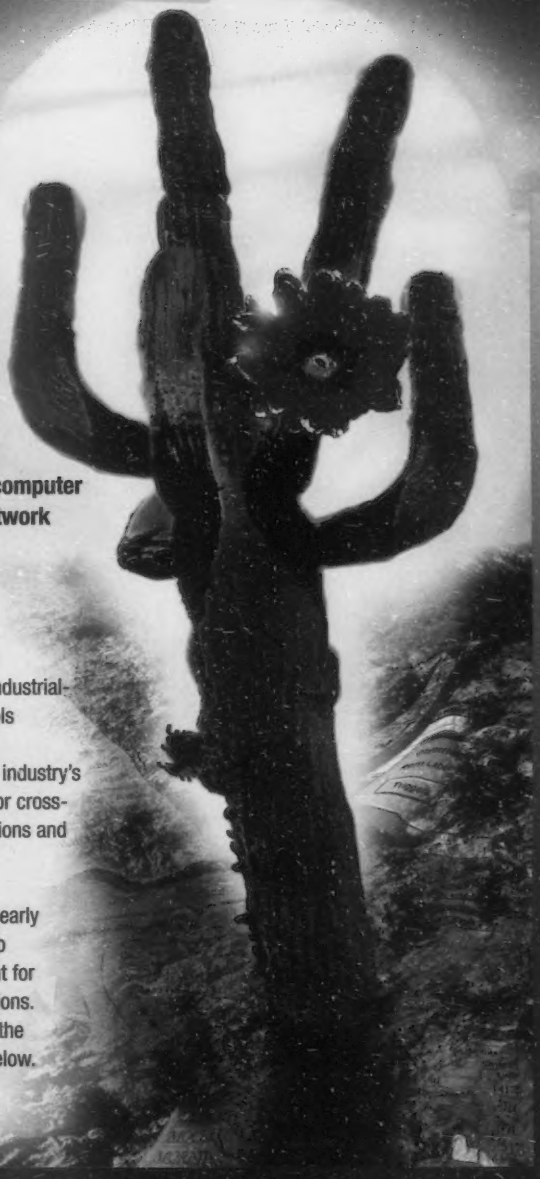

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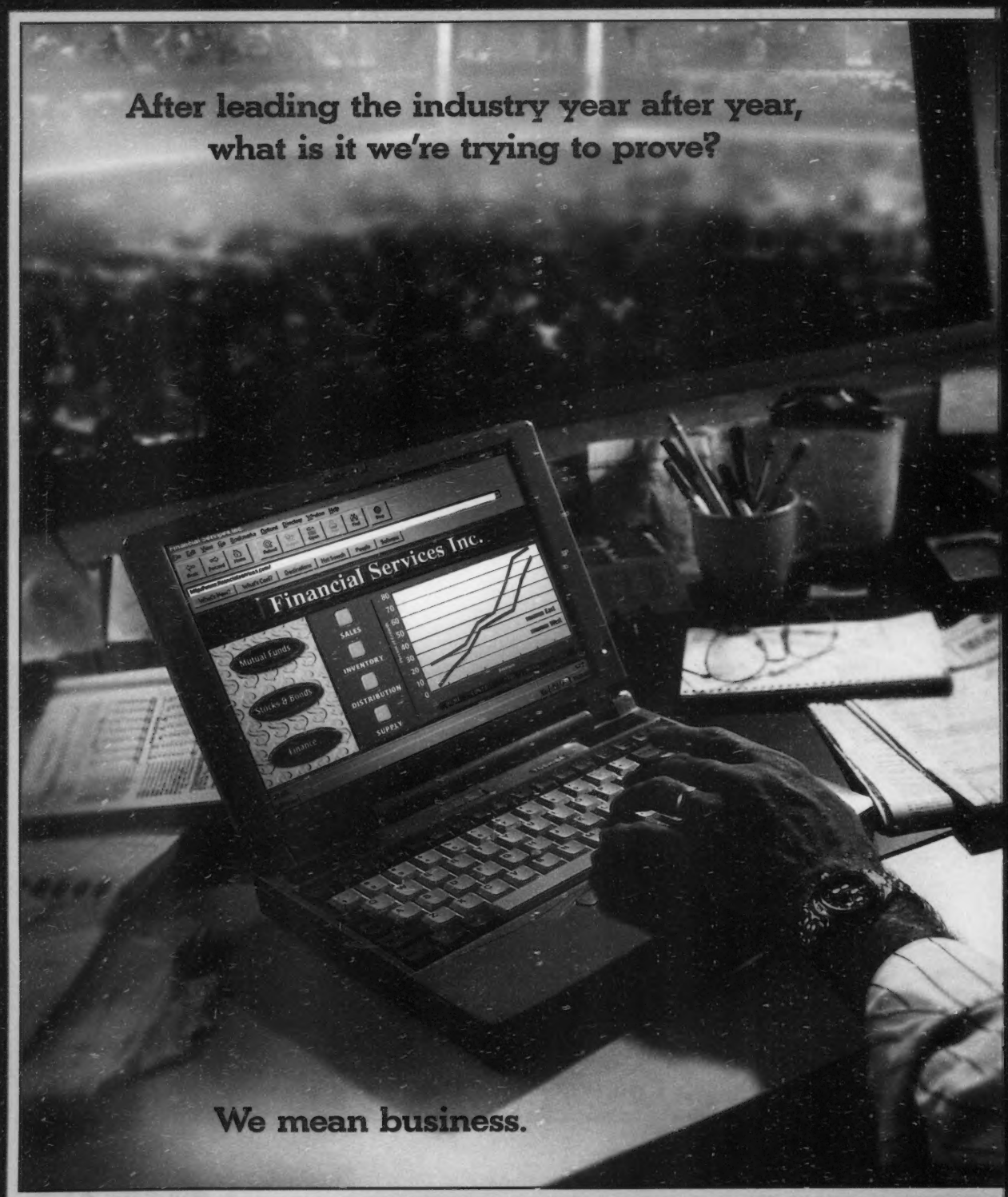

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The Enterprise Network

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Briefs

Lantronix moves fast

Lantronix in Irvine, Calif., announced the LSW8F Fast Ethernet Switch, which provides 10M or 100M bit/sec. of bandwidth through each of its eight ports. The product is shipping now for $1,595.

LAN/ATM links

Token Ring power Madge Networks, Inc. in San Jose, Calif., last week said it will develop Asynchronous Transfer Mode (ATM) uplinks for its next-generation Ethernet and Token Ring switches and will continue to develop its Collage 700 ATM backbone switches.

Time to Rumba on NT

Wall Data, Inc. in Kirkland, Wash., released Rumba Office 95/NT for TCP/IP, a suite of access applications that let users attach to multiple host systems from one browser screen. Features include Internet access, a news reader, an NFS Client for Unix files and persistent host connections. Rumba Office 95/NT for TCP/IP costs $350, or $75 for an upgrade of the 16-bit version.

New protocol analyzer

AG Group, Inc. in Walnut Creek, Calif., this week will introduce its EtherPeek for Windows Version 2.0. The product is an Ethernet network and protocol analyzer for Windows NT and Windows 95. It offers real-time and post-capture packet analysis and packet decoder. It was designed to simplify the troubleshooting of mixed platform and multiprotocol networks. EtherPeek for Windows 2.0 will ship next month for $995.

Worldwide remote access server revenues

Source: Dell'Oro Group, Portola Valley, Calif.

• Chicago Stock Exchange

Brokers get break – fewer monitors

By Bob Wallace

THE CHICAGO Stock Exchange plans to embark on a campaign to reduce the number of desktop computers its traders use to execute trades.

Most traders now jump from one computer to another to get stock quotes, monitor financial news services and view information piped in from far-flung exchanges using relatively slow terminal emulation software.

The exchange's Special Station program calls for an upgrade to NetPower machines, which have Intel Corp. 266-MHz Pentium microprocessors. Traders will use a single graphical user interface that runs under Windows NT 4.0 to access all applications, which will appear as icons on the screen.

The Special Station program will start Sept. 15, but a completion date hasn't been set yet.

"We have to eliminate multiple terminals, and that in itself will make life far easier for our traders," said John Kavanagh, manager of communications and facilities at the exchange. "It's the biggest challenge we face."

Traders use workstations with four monitors or dumb ASCII terminals, depending on the number of applications they need to access.

One trader applauded the Special Station program.

"Integrating and combining

Exchange, page 57

KURT GERBER

The Chicago Stock Exchange's John Kavanagh: Eliminating multiple terminals will make life easier for traders

User alliance presses Microsoft on NT

► *User groups are a force for change*

By Laura DiDio

A MEETING OF Windows NT user groups last week highlighted how informal organizations have become a force for effecting change and getting the word out about fixes and workarounds not found in manuals.

The Windows NT Intranet Solutions show in San Francisco drew about 150 attendees from more than two dozen groups. The group met to elect officers and consolidate plans to lobby Microsoft Corp. for specific enhancements, said Mark Kapczynski, interim president of the World-Wide Association of NT User Groups (WANTUG). The meeting "is a way for regional user groups to expand and take advantage of shared resources," he said. Members agreed, saying that when user groups talk, Microsoft listens.

About two dozen Windows NT user groups of varying size and activity are spread throughout the U.S. WANTUG was formed in June with the backing of Microsoft.

Top concerns of Windows NT users:

- Wolfpack clustering for fault tolerance
- Plug-and-play support for brand-name adapters and peripherals
- Support for roaming users
- Availability of very large storage systems for NT
- Better technical documentation for new technologies

FAST ACTION

"The NT user groups are a force to be reckoned with, collectiveiy and individually," said Richard Warren, vice president of information services at Judd's, Inc., a large printing company in Strasburg, Va. "When Microsoft hears the user groups raise problems that could be a barrier to adopting a Windows NT solution, they get dealt with, fast."

For instance, the Washington NT user group and others are pushing for Microsoft to include in Windows NT 5.0 support for hierarchical storage management devices that can support multiple terabytes of data, such as those found in the Unix platform. "So far, the feedback [from Microsoft] has been positive, and I'm hoping this functionality will be part of Windows NT 5.0," Warren said.

Mike Crowley, vice president and chief information officer at Rich Products Corp. in Buffalo, N.Y., agreed. "The NT user group is an efficient way to let our technical staff get information about new products and the first word on fixes, especially since it's not always feasible to take the time to travel to trade shows and attend a

User alliance, page 57

SOFTWARE TESTING

Bank speeds rollout of applications

By Patrick Dryden

THE NATION'S second-largest bank is overhauling the way it rolls out client/server applications to 22,000 users throughout its wide-area network.

Information systems managers at NationsBank Corp. plan to slash the time needed to ensure applications work well across the WAN from eight weeks to one. They will do so by streamlining the test process and applying a new off-the-shelf performance analysis tool.

The overall savings potential is tremendous, said Will McDuffie, senior vice president at NationsBank in Charlotte, N.C.

"Once we get there, the new efficiency should save about $283,000 in manpower for the applications we test [in a year]," McDuffie said. Additional "soft savings" include better software

Bank, page 57

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User alliance presses Microsoft

CONTINUED FROM PAGE 53

week's worth of classes," Crowley said.

Other features NT user groups are pushing for include Wolfpack clustering (due within the next six months), support for roaming and mobile users, plug-and-play support for brand-name adapters and peripherals similar to what is available for Windows 95, support for very large disk storage systems and better technical documentation for the new Internet technologies.

"Wolfpack clustering is a very big deal for us. We're also pushing [in the user group] for Microsoft to hurry up and deliver plug-and-play support in Windows NT. It's a beautiful thing in Windows 95 because it provides us with consistent support for name-brand adapters and peripherals. The fact that we don't have it yet in Windows NT is irksome, but the user group helps us avoid the pratfalls of using incompatible devices by telling us what's safe," Crowley said.

"The NT user group is an efficient way to let our technical staff get information about new products and the first word on fixes."
– Mike Crowley, Rich Products

Dennis Martin, president of the Windows NT Rocky Mountain Users Group in Denver — which has about 600 dues-paying members and more than 2,000 users on its mailing list — said the group often provides its members with workarounds.

That was the case in January, he said, when Microsoft shipped a buggy Service Pack 2 release for Windows NT 4.0. The Rocky Mountain Users Group and several other groups found workarounds for crashes and other common problems well before Microsoft shipped a patch, Martin said. □

Exchange to pare monitors

CONTINUED FROM PAGE 53

systems will save us time, which is important because markets move in seconds," said Market Traders, Inc.'s Dave Karsten. "This program will help us react to markets much more quickly, which will make us more efficient."

"Computers were supposed to revolutionize stock trading for years, but it sounds like maybe we're going to see some results soon," said Hans Stoll, director of the financial markets research center at Vanderbilt University in Nashville.

Traders at the nation's second-largest stock exchange use an autoquote application that facilitates trading by letting other exchanges know at what point a trader is willing to buy a stock.

Also provided are financial information services that let traders know what is happening outside the exchange. They are piped in via wide-area network links and 3Com Corp. routers.

SLOW AND CRANKY

Traders saw slow response times and unpredictable performance using the old system, Kavanagh said.

Because applications with graphical interfaces generate more network traffic than network emulation, the exchange had to pull off a sweeping LAN infrastructure upgrade to set the stage for Special Station.

It replaced its shared Ethernet network with Ethernet and Fast Ethernet switches, as well as routers from 3Com. It also replaced Cabletron Systems, Inc. hubs and Bay Networks, Inc. routers, Kavanagh said.

"We weren't heavily utilizing the shared LANs, but we were experiencing data collisions and decided to make a move upward," he said. "That problem went away with the upgrade because we installed switching."

The upgrade was done in stages over a period of six weeks, during the hours after the exchange closed. Traders' desktops were disconnected from hubs and connected to the switches. "End users never knew an upgrade happened," Kavanagh said. □

Cabletron readies remote access products for 56K

By Marc Ferranti

CABLETRON SYSTEMS, INC. is set to bolster its CyberSwitch line with new remote access products that support 56K bit/sec. connections.

Rochester, N.H.-based Cabletron next month will ship two new remote access product lines: the CSXDIG modem module and the DSX 5500 central site access server. Both support the 56K Flex standard proposed by Rockwell Semiconductor Systems Ltd. and Lucent Technologies, Inc.

The CSXDIG, which comes in 24- and 30-port configurations, is a 56K bit/sec. digital modem module for Cabletron's CyberSwitch line of central site remote access platforms. It costs $479 per port.

The modules support analog and digital modems on the same Integrated Services Digital Network (ISDN) ports. They can also allow analog modem dial-in calls via channelized T1 lines.

The CSX 5500 central site access server provides six modular slots that support more than 120 simultaneous remote users. Prices for various configurations run from $171 to $699 per port.

It offers four WAN connections and two LAN connections, and supports ISDN, frame relay, leased lines, switched 56/64, and X.25 interfaces. □

Ferranti writes for the IDG News Service in New York.

Bank speeds app rollout

CONTINUED FROM PAGE 53

reliability and performance, he said, plus more time for engineers to pursue other projects.

The process of moving client/server applications out of the lab and onto the production network frequently exposes performance problems, according to Theo Forbath, a consultant at Northeast Consulting Resources, Inc. in Boston.

Delays and constrained bandwidth of WAN connections can cripple the performance of applications that had worked well on a developer's LAN, Forbath said. So programmers must revamp core transactions, or network managers must boost bandwidth, both of which stall rollouts and jack up costs.

To address that problem, NationsBank dedicated a network engineer to gather the pilot application's transactions with a protocol analyzer and then check the exchanges line by line.

FROM EIGHT WEEKS TO ONE

Automating some steps in a new test lab reduced that task from eight weeks to five, McDuffie said. Now he expects to accomplish the same work in one week with the help of Application Expert software from Optimal Networks Corp. in Palo Alto, Calif.

The tool puts a graphical front end on the trace data, McDuffie said, so an engineer can quickly and easily analyze transactions and evaluate possible changes. "We can just about cover the cost of the product through the time it saves an engineer to do one analysis," he said.

Application Expert runs on a Windows NT or Windows 95 PC with at least 32M bytes of memory and the ability to monitor the traffic between the designated client and server. It costs $15,000.

While trying out the new review process, network engineers discovered a turnkey application that didn't perform as promised.

Optimal's tool showed that the application generated more traffic than the vendor advertised, McDuffie said. IS and the client were able to get the offending software reworked to batch its requests for lower overhead. "The WAN is our critical funnel, so we must pay close attention these days to how well applications are built," he said. □

NEW PRODUCTS

TRITICOM has announced BRouteIT Version 3.0, a software-based Ethernet bridge and router.

According to the Eden Prairie, Minn., company, the new version lets users set up a dedicated PC and make simultaneous connections with Ethernet and Asynchronous Transfer Mode interfaces at up to eight remote locations. Network administrators also can connect the software to a mail or World Wide Web server so that up to seven users can dial in to access electronic mail or the Internet.

Software licensing costs $345.

Triticom
(612) 937-0772
www.triticom.com

ALLIED TELESYN INTERNATIONAL in Sunnyvale, Calif., has announced the AT-MR904TX, a stackable Fast Ethernet hub for small and home offices.

The four-port, entry-level hub provides 100Base-TX Fast Ethernet connections among LAN workstations, LAN servers, routers, bridges and switches. Users can stack four-, eight- or 12-port units as networks grow.

The hub costs $325.

Allied Telesyn
(408) 730-0950

OSICOM TECHNOLOGIES, INC. has announced the IQX-200, a remote access server that can handle from eight to 168 concurrent connections.

According to officials at the Santa Monica, Calif., company, the IQX-200 supports digital and analog dial-in users with network scalability up to 168 ports.

The remote access server provides a migration range from 10Base-T to 100Base-T and Fiber Distributed Data Interface.

Pricing starts at $3,050.

Osicom Technologies
(888) 674-2668
www.osicom.com

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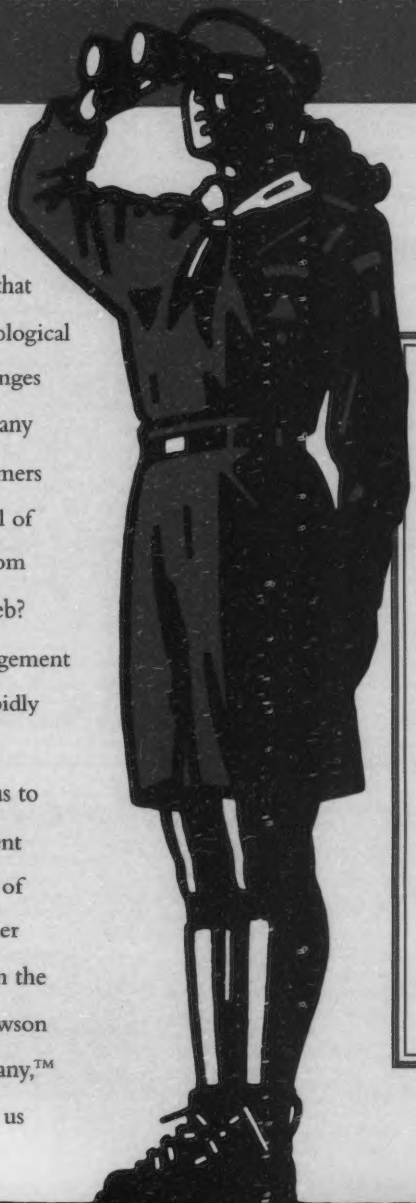

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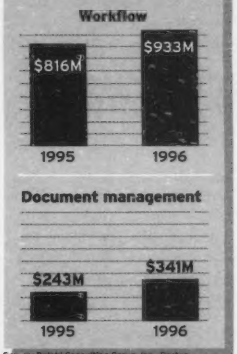


Source: Delphi Consulting Group, Inc., Boston

Mainframe middleware

BEA Systems, Inc. released several middleware products to make mainframe systems simpler. The Sunnyvale, Calif., firm, which sells the Tuxedo transaction monitor, BEA MessageQ and BEA Object Broker, will release a version of Tuxedo for the AS/400 and the mainframe. Other products include a tool to connect to IBM's MQSeries middleware and BEA Manager, which manages BEA's suite of middleware products.

Natural Y2K effort

Reasoning, Inc., a year 2000 vendor in Palo Alto, Calif., teamed with Formal Systems, Inc. in Fredericton, New Brunswick, to develop analysis and conversion software for Natural language programs.

Tandem data access

Tandem Computers, Inc. in Cupertino, Calif., plans to resell data access software developed by International Software Group Ltd. (ISG) as an option for its NonStop SQL/MX database. ISG Navigator, which conforms to Microsoft Corp.'s OLE database specification for accessing distributed data, is scheduled for fourth-quarter availability through Tandem, officials at the companies said. Pricing wasn't disclosed.

SAP links homegrown supply chain

By Randy Weston

SAP AG is bringing supply-chain management functionality home.

The Germany-based software giant is building an application for its flagship business process automation system, R/3, that is meant to help businesses manage inventory and better plan and schedule the use of supplies.

SAP has relied on other vendors, including I2 Technologies, Inc. in Irving, Texas, to supply functionality to R/3 customers. Others are Manugistics, Inc. in Rockville, Md., and Numetrix Ltd. in Toronto.

"SAP has deals with everyone in this area," said Bruce Richardson, an analyst at Advanced Manufacturing Research, Inc. in Boston. "SAP [officials] told us three years ago they want to own every element in the supply chain. Now they are delivering on that promise."

SAP is to release details about the application, such as which functionality will be included and a time line for its release, at the company's user group conference Aug. 24 in Orlando, Fla.

SAP, page 60

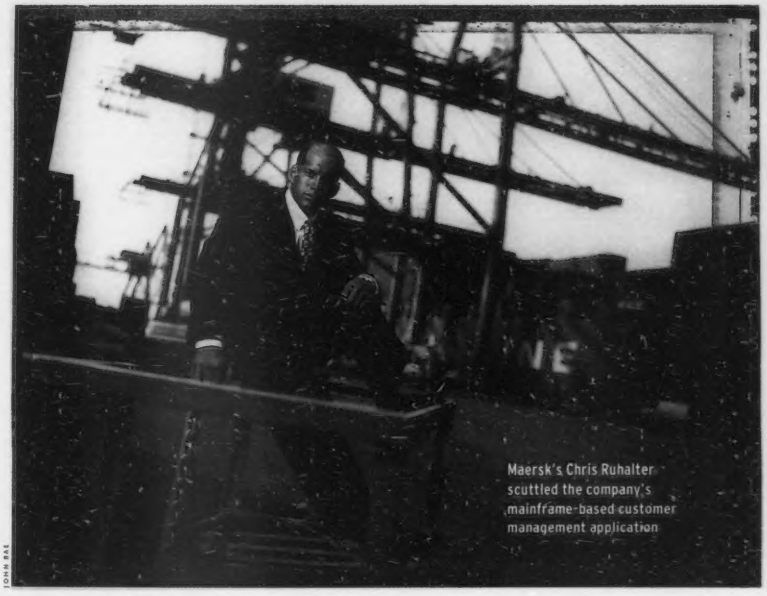
Shipper automates sales force

By Kim Girard

SEVERAL MONTHS ago, employees selling cargo space for Maersk, Inc., one of the world's largest shipping companies, still stuffed customer account information into file cabinets.

Some sales managers — who are making multimillion-dollar deals — connected to the office mainframe using old laptops from home; others printed information from computers at a branch office. Little valuable information was shared among the sales force, and when employees left, client his-

Shipper, page 60



JOHN RAE

Maersk's Chris Ruhalter scuttled the company's mainframe-based customer management application

Middleware scales new objective

By Tim Ouellette

VENDORS ARE GIVING middleware a new objective.

Spurred on by users who want to bolster their object-oriented applications with high-powered data messaging, vendors are starting to merge the two technologies into one.

The first true effort comes from Tibco Software, Inc., which recently announced TIB/ObjectBus 2.0, an object request broker (ORB) that is compliant with Common Object Request Broker Architecture (CORBA) 2.0 and that is built on top of Tibco's Rendezvous messaging middleware.

MIDDLEWARE IS THE OBJECT

Communications options for Tibco's messaging middleware/object technology tool

- Internet Inter-ORB Protocol support
- Internet broadcasting or Tibco's proprietary multicasting data messaging
- Multithreading for asynchronous data requests
- Subject-based message addressing

MORE AND MORE

The move is important because object technology has a lot of momentum, but it still can't scale to the huge number of

Middleware, page 64

COURSEWARE

Software aids in design of training material

By Matt Hamblen

AS CORPORATIONS begin to use more computer-based training for teaching everything from customer service to sales, trainers feel more pressure to plan coursework and standardize it no matter which trainer leads the teaching.

More companies are adopting computer-based training, usually with CD-ROMs, sometimes

Course design, page 60

SAP supply chain

CONTINUED FROM PAGE 59

Richardson said it likely will take SAP at least 18 months to develop the application, and many companies that need to rein in their supply chain may not want to wait.

Those users can still turn to the third-party vendors that SAP has promised to continue supporting.

But users who can hold off may get a better deal because SAP is likely to include the supply-chain module in the existing total price of R/3. Buying a system from a third-party player tacks on another $1 million to $2 million to the price of R/3, which can reach up to $10 million with services.

"It's a function of how much pain do you want to endure and how aggressively do you want to approach installing a supply-chain system," Richardson said. "People are spending a fortune on supply-chain software, and the fact that you will soon be able to get supply-chain management systems from your [enterprise resource planning] vendor is very attractive."

Scientific Atlanta, Inc. is willing to wait. The $1.1 billion maker of equipment for the cable and telecommunications industry has completed 90% of an R/3 installation it began in June 1995.

Scientific Atlanta is looking at supply-chain management functions to tightly control subcontracted manufacturing work and delivery of items such as modems and lasers from suppliers such as Motorola, Inc. in Schaumburg, Ill., said Greg Wilson, group director of information technology at the Atlanta company.

Although Scientific Atlanta was planning to use supply-chain functionality from a third-party vendor, the company would be willing to wait for SAP to come out with its own module because of the tight integration that product will have with the R/3 module, Wilson said.

"We have been looking at our supply chain since the beginning of this project," Wilson said. "Our main function for putting SAP in is to integrate. We had a lot of different systems in our divisions. We put in SAP to get the basics, and now we can look at other options from them, like supply-chain management." □

Shipper automates its sales force

CONTINUED FROM PAGE 59

tory often went with them.

"It was, 'Whatever you want to do,'" said Lee Johnson, a regional sales manager in Los Angeles who has worked at Maersk for seven years. "We didn't have [a system]. We had a primitive database that covered about 25% of our customers."

"It enables you to ... plan and organize sales calls on a much higher level."
– Lee Johnson, Maersk

Chris Ruhalter, sales automation manager at the Madison, N.J.-based company, last year aimed to save the sales force time and the company money by changing the customer management application from mainframe to an easy-to-use client/server platform.

Maersk looked at software from Saratoga Systems in Campbell, Calif.; Maximizer Technologies, Inc. in Vancouver, British Columbia; Aurum Software, Inc. in Santa Clara, Calif.; and other companies before choosing upstart Borealis Technology Corp. in Carson City, Nev. Borealis' software was the easiest to adapt to meet the needs of the sales department, Ruhalter said.

"A lot of the [other sales] systems are overbuilt, and some systems have a built-in methodology applied to them that doesn't apply to the way we sell," he said.

Johnson said he soon will be able to filter — assign categories to 22,000 accounts based on a customer's financial history — and query for reports that will help him determine customer buying patterns. He will also be able to separate customers into groups — for instance, all customers in the Los Angeles area or all import accounts from Hong Kong — so he can target sales pitches or send faxes more quickly and easily.

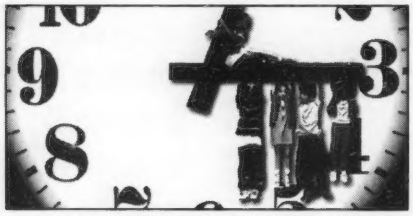
Maersk began to install Arsenal 3.0, Borealis' sales force automation software, in late May and finished the job last month — much quicker than the expected six to 12 months.

Borealis' challenge — in a market where projects often fail — is to deliver on its promise of a shorter installation time and provide a system that is easy to use, said Chris Pavlic, an analyst at Aberdeen Group, Inc. in Boston. "If it's not easy to use, the laptop will stay in the car trunk under the old golf clubs," Pavlic said.

Maersk's 200 sales representatives and telemarketers use IBM ThinkPad 760 PC notebooks that run Windows 95 and are equipped with remote access software from XcelleNet, Inc. in Atlanta. Users dial in to a Hewlett-Packard Co. 9000 server. The company created a virtual private network using IBM 8235 routers.

"Once we get this up and running, we'll have 80% of customers covered," Johnson said. "It enables you to manage your time better, track customer contacts much better and plan and organize sales calls on a much higher level." □

3-TO-6 PM HAS BECOME A FRIGHTENING TIME FOR CITY PARENTS.



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Course design software

CONTINUED FROM PAGE 59

supplemented with instructors, analysts said. Not only is the new approach less expensive than arranging travel and lodging for trainees or trainers, but it also adds flexibility, analyst Brandon Hall said.

"The crunch is for more training for more people, more quickly and in more places on more topics," said Hall, editor of "Multimedia and Internet Newsletter" in Sunnyvale, Calif.

SBC's Donald C. Highley: **The program "has changed our whole procedure"**

Trainers said they need to ask many questions before training begins, including: Is using an instructor better than using a computer-based approach? What are the best ways to evaluate performance? How can you justify the training cost to upper management?

At SBC Center for Learning in Irving, Texas, trainers tackled pretraining concerns by using software that leads a course design team through a series of questions and checkpoints to plan and prepare courses.

The software, Designer's Edge Pro 2.0, was developed by Allen Communication in Salt Lake City and Aimtech Corp. in Nashua, N.H. Two analysts said the software is innovative because it asks preliminary questions for course design that existing course-authoring tools don't provide.

SBC has been using 68-seat licenses of the software, which cost $2,995 each, to build courses for 60,000 employees at Southwestern Bell Corp.

The program "has changed our whole procedure, and it's enabled us to embed performance metrics in the process," said Donald C. Highley, a top trainer at SBC. "A company may have a process [for designing courses] in place, but the tool to do it is nonexistent."

At Sprint Corp. in Kansas City, Mo., Designer's Edge is being used to prepare in-class training courses and eventually will be used for the company's intranet, said Dan Revelle, manager of training and development programs at Sprint.

"The software allows us to take a Sprint training process and automate that with templates and wizards and training cards," Revelle said. Once completed, the material can be handed off to a teaching team. "It forces every course to be developed the same way," he said.

Gartner Group, Inc. in Stamford, Conn., estimated that the worldwide market for technology-based training reached $10 billion last year and would rise to $12 billion next year. Technology-based training was 16% of the total training delivered last year, but that number is expected to reach 35% next year, according to a survey last year by *Training* magazine.

In a survey of 1,375 course developers, CBT Solutions in Hingham, Mass., found that no one course-authoring tool owned the market, although software from Allen Communication was listed as most often used — behind several packages from Macromedia, Inc. in San Francisco. □

Coming in our August 25th issue of Computerworld...

COMPUTERWORLD Intranets

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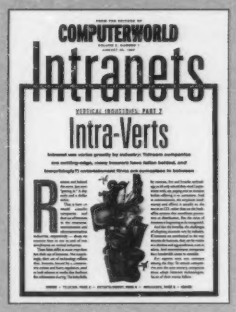
Usage in the telecom, entertainment and insurance industries

Companies in many industries are including intranets in their strategic plans. Bridging disparate systems; increasing efficiency – and thereby competitiveness; easing access to documents across departments and campuses – these are some of the common benefits. But each industry has specific needs and challenges, too. In Part II of our series on vertical industries, we'll show you what intranets are offering to telecom, entertainment and insurance firms.

❶ A MONTHLY COMPUTERWORLD SUPPLEMENT



Each month we bring you an in-depth analysis of some aspect of intranets. Topics can be technical – how are your peers managing their intranets? – or business-oriented: what is "push" technology, and does it belong on your company's system? Our comprehensive package is full of user stories, advice and more. And it's bound right inside Computerworld.

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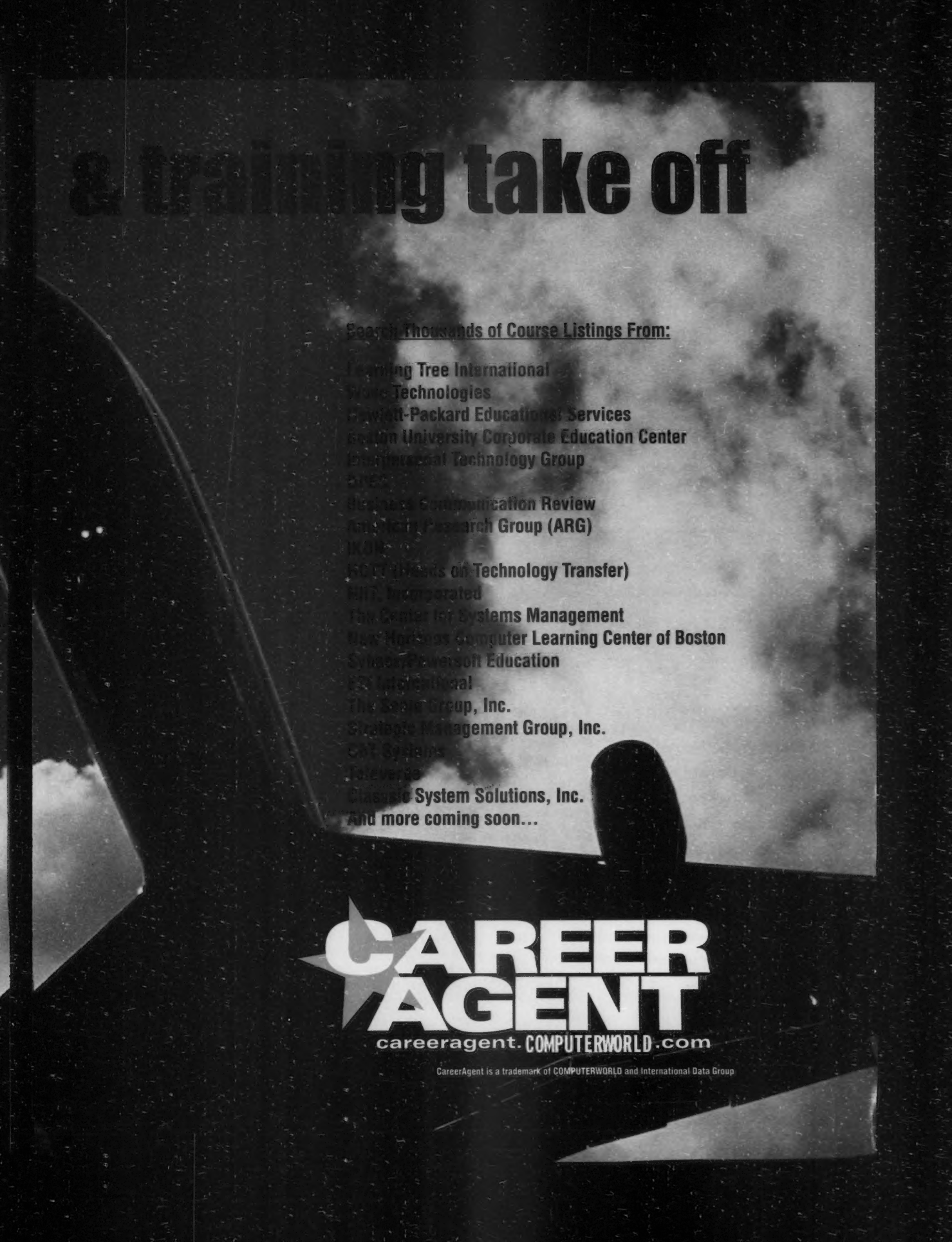
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Middleware's new object

CONTINUED FROM PAGE 59

users and mix of application platforms needed to run enterprisewide.

"More and more people are finding out [that object technology's] synchronous processing doesn't work well enough," said J. P. Morgenthal, a Java computing analyst at NC.Focus, a consultancy in Hewitt, N.Y. "You really need that guaranteed delivery messaging middleware can provide."

CORBA was built using synchronous messaging, which requires a direct connection between hosts — even if one is in a remote location — and can cause problems when one side is unavailable or crashes.

On the other hand, messaging middleware products such as Tibco's Rendezvous and IBM's MQSeries use asynchronous data messages to provide guaranteed and secure delivery of data among applications on different platforms and can scale to very large installations.

In fact, Rendezvous has had a 10-year history running in high-performance financial systems, which need reliable, up-to-the-minute data exchanges among applications.

STABLE HISTORY

"The fact that it is based on Rendezvous, a well-established product, means the networking infrastructure is more proven," said Nigel Barnes, a consultant at Andersen Consulting in London, who is working on an ObjectBus project.

For example, Rendezvous will let users make one request for information about a subject, and messages on that subject will go to the user from all enterprise applications tied to ObjectBus.

The move is important because object technology has a lot of momentum, but it still can't scale to the huge number of users and mix of application platforms needed to run enterprisewide.

But object request brokers would require users to query each enterprise database separately.

Users have also noted that better integration of object and messaging middleware technologies will trim training and labor costs, because companies wouldn't have to hire two sets of skills.

Still, though object technology has taken off, both approaches have been an expensive and complex proposition that has slowed overall adoption. Few shops try to use both technologies.

Other vendors have bolted together object-based programming and middleware, but Morgenthal said Tibco's effort is the first time a vendor has built the ORB on top of middleware product for better performance. The industry has taken note of the possibilities of such a move.

Last winter, the Message-Oriented Middleware Association, made up of vendors in the middleware arena, agreed to deliver products similar to ObjectBus 2.0 [CW, Feb. 17]. Vendors involved include IBM, with its Component Broker product line, and San Francisco-based Peer-Logic, Inc. Products aren't expected until next year.

Tibco, in Palo Alto, Calif., will ship TIB/ObjectBus 2.0 in the fourth quarter. It will cost $600 per client and $5,000 for a developer's kit. The product will support Unix, Windows NT and Digital Equipment Corp.'s VMS platform. □

SIEMENS

Before you buy another phone, check the

NEW PRODUCTS

SEAGATE SOFTWARE has announced Seagate Direct Tape Access 3.0, software that controls access to tape storage and other media devices from within any Windows application.

According to the Heathrow, Fla., company, the new version lets users drag and drop folders or entire hard drive contents to copy targets such as tape drives, hard drives or network drives.

Scheduling options are included for copy automation. A new disk caching feature writes data to disks and tape simultaneously.

The product costs $79.

Seagate Software
(407) 531-7500
www.seagatesoftware.com

TEKRAM TECHNOLOGY has announced On-Camera Video Mail Kit, which enables users to create video-mail messages.

According to the Fremont, Calif., company, the multimedia bundle supports the production of two-minute digital movies with audio that can be compressed to 1M-byte files and transferred with electronic-mail messages sent over the Internet. The kit includes the video-mail software, a full-motion video capture card and desktop color camera.

The package costs $225.

Tekram Technology
(800) 556-6218
www.tekram.com

KOFAX IMAGE PRODUCTS has announced Storage Controls 1.0, a new ActiveX tool kit for integrating optical jukebox storage controls into Windows applications.

The Irvine, Calif., company said the development tools help create applications that let users access and manage one or more optical device or jukebox subsystem running on Windows NT or Novell, Inc.'s NetWare. Features include a file-management control for transferring documents to shared optical devices on a network and a volume-management control to search networked volumes for information and files.

Storage Controls 1.0 costs $995.

Kofax Image Products
(714) 727-1733
www.kofax.com

INFORMATION ELECTRONICS, INC. has announced Eureka Gold, software that uses artificial intelligence to determine if electronic-mail is junk mail.

The St. Simons Island, Ga., firm said Eureka Gold with Anti-Spam installs on E-mail servers. It was designed for high-volume installations, but the company priced it for small enterprises. Anti-Spam definition updates are free.

Eureka Gold costs $1,000.

Information Electronics, Inc.
(912) 638-1893
www.ie.com

SOFTKIT TECHNOLOGIES, INC. in Montreal has announced Live Access, software that uses hyperlinks, visual content browsing and imaging to increase information retrieval abilities.

Users can link and access documents that reside anywhere in their computing environment, including the Internet. Using features called Live Guide and Live Space, users can create a custom hierarchy and link documents to drawings, maps and images.

Live Access costs $195.

Softkit Technologies
(514) 393-3467
www.softkit.com

KETIV TECHNOLOGIES, INC. has announced ArchT 14, an architectural application for AutoCAD designers.

The Portland, Ore., firm said new features in the ArchT 14 release include ObjectARX steel-detailing capabilities, the ability to design curved walls and stairs and integrated support for AutoCAD Release 14 rendering in Windows NT and Windows 95. The installation and setup of ArchT 14 also has been streamlined.

ArchT 14 costs $495.

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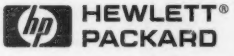


Intel Pentium II-based PC Workstation. The Intel Inside logo and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. Windows NT is a U.S. registered trademark of Microsoft Corporation. Pancake event and person in this ad are fictitious. ©1997 Hewlett-Packard Company. FPG467

Servers & PCs

Large Systems ♦ Workstations ♦ Portable Computing

Briefs

ALR servers

Advanced Logic Research, Inc. (ALR) in Irvine, Calif., has released its ALR Revolution 2XL, a departmental server with dual Pentium Pro and Pentium II chips. The server ranges in price from $3,500 to $4,500. It features 256K or 512K bytes of L2 cache on Pentium Pro models or 512K bytes of cache on Pentium II models. The models support Peripheral Component Interconnect and Extended Industry Standard Architecture bus architectures.

Compaq prices sliced

Compaq Computer Corp. last week cut some notebook prices by up to 25%. The reductions affect five models from the Armada and 1500 notebook lines. The Armada 4110, with a 100-MHz Intel Corp. Pentium processor, 8M bytes of RAM and an 810M-byte hard drive, drops from $1,199 to $999. The Armada 4110D — the same machine but with a four-speed CD-ROM drive — falls from $1,599 to $1,198. The Armada 1530, with a 133-MHz Pentium MMX, 16M bytes of RAM, a 1.4G-byte hard drive and a 10-speed CD-ROM, drops from $2,899 to $2,499.

Shark price tags dive

Avatar Peripherals, Inc. in Milpitas, Calif., announced a new price of $199 after a $50 mail-in rebate for its Shark 250 mobile hard disk drive with mini-removable media. The Shark 250 suggested retail price was reduced from $299 to $249, and the $50 mail-in rebate program was extended through year's end. The pricing and rebate apply to Avatar's entire line of Shark drives, including the Shark 250 Parallel Port and the new PC Card version.

Acer notebook debuts

Acer America Corp. in San Jose, Calif., last week unveiled a multimedia notebook that costs $2,799 to $3,499. The Extensa 670 features a 166-MHz Intel Corp. Pentium MMX processor, 16M to 32M bytes of RAM, a 1.6G- to 2.1G-byte hard drive and a 10-speed CD-ROM.

Workstation power to the people

▸ *PCs with RISC-like punch for less money*

By April Jacobs

Benefits of the new class of PC workstations

- Low price, $5,000 to $15,000
- High performance, 200-MHz and higher processors
- Intel/Windows-compatible
- Simplified management compatible with existing Windows users

UPCOMING INTEL Corp.-based workstations that cost a fraction of their RISC-based counterparts offer to give users power that was once considered too expensive.

The systems can run new applications or older ones ported from Unix and proprietary operating systems, such as Digital Equipment Corp.'s VMS, to the Wintel platform.

"We had 20 DEC workstations that were running on VMS. But now that the software we were using can run on NT, we're going to high-powered PCs," said Henry Peterson, field and systems coordinator at Holden Engineering and Sur-

Workstations, page 68

Sun slashes prices on Unix servers

By Ed Golden

Sun Microsystems, Inc. last week announced a price cut on its low-end Ultra Enterprise 3000 departmental Unix server and revealed plans to add a high-end feature to that and other Ultra Enterprise machines.

Sun will cut prices on the Ultra Enterprise 3000 by up to 27%, officials said. And by the middle of next year, the Mountain View, Calif.-based firm will add dynamic reconfiguration/alternate pathing capabilities — first deployed in the high-end Ultra Enterprise 10000 — to the Ultra Enterprise 3000, 4000, 5000 and 6000 servers, Sun said.

The dynamic reconfiguration/alternate pathing feature enables CPUs, memory and I/O devices to be attached and detached without disrupting a user's environment.

Ultra Enterprise 3000 prices start at $43,250 for a configuration with two 167-MHz UltraSPARC processors and 256M bytes of memory. An upgrade will be available to add dynamic reconfiguration/alternate pathing capabilities to the Ultra Enterprise 3000-6000 systems.

— Golden writes for the IDG News Service in Boston.

REVIEW▸

PANASONIC PERSONAL COMPUTER CO.
Secaucus, N.J.

CF-25

Price: $4,199

Pros: Virtually indestructible; large, thin film transistor (TFT) screen; extra PCMCIA slot; fast performance

OVERALL B+ GRADE

Cons: Lacks onboard microphone input; no bundled operating system install disks or CD included

CF-35

Price: $3,955

Pros: Lightweight; long battery life; large TFT screen; "multimedia loaded"; fast graphics adapter; very fast performance

OVERALL B+ GRADE

Cons: No bundled operating system install disks or CD included

Panasonics can take a punch

▸ *Rugged machines deliver on power, durability*

By Lenny Bailes

A PAIR OF new notebooks from Panasonic Personal Computer Co. aren't only loaded with features at a reasonable price, they can also take a licking.

Panasonic's "rugged" CF-25 is aimed at markets such as law enforcement and is promoted as an indestructible unit. The second notebook, the CF-35, which Panasonic calls Slimline, is less ruggedized but still shock-resistant. The CF-35 is an MMX multimedia machine, with a five-hour battery, fast 128-bit graphics adapter, wave table sound and an onboard Universal Serial Bus (USB) port.

Both notebooks ship in 133- and 150-MHz configurations with up to 64M bytes of RAM, 12.1-in. 800- by 600-pixel thin film transistor LCD, 32-bit PC Card support, a sound card and a "multimedia pocket" that can accept a floppy drive or an optional 10-speed CD-ROM unit.

MINOR GLITCHES

We discovered a minor problem with Symantec Corp.'s Norton Utilities 2.0 when we swapped out the floppy drive. On both notebooks, this action caused the Norton Protected Recycle Bin to behave erratically. You can bypass the problem with a bundled cable that permits the floppy drive and CD-ROM to operate simultaneously.

I would prefer that Panasonic (*www.panasonic.com*) shipped either a Windows 95 CD or a set of OEM disks with these notebooks. Both machines flash a re-

Panasonic, page 69

REVIEW▸ *Gateway Solo 9100*

Powerhouse laptop weighs heavily

By James M. Connolly

THE SOLO 9100 notebook PC from Gateway 2000, Inc. (*www.gw2k.com*) makes people sit up and take notice. I know because I walked into a meeting room, put my Solo-laden briefcase on the wooden floor and the thump from the 9.2-pound machine woke up everyone at the table.

People also notice that the Solo 9100 is slick, featuring a 166-MHz Pentium MMX CPU and extensive multimedia capabilities that position it well for a marketing representative who does complex road shows. However, the weight takes its toll on your arm at the end of a travel day.

TOO MUCH

For someone whose mobile computing needs typically involve writing, sending electronic mail and World Wide Web browsing, the Solo 9100 may be overkill. However, it didn't flinch on a fat Microsoft Corp. PowerPoint slideshow, and the display turned in a credible performance on animated games and video clips.

The active-matrix thin film transistor display is large at 13.3-in., and it's sharp. The viewing

Gateway, page 68

Processor: 150-MHz or 160-MHz Pentium MMX
Memory: Up to 160M bytes
Hard disk: 3G bytes
Weight: 9.2 pounds
Price: $5,699

Workstations to deliver power for less

CONTINUED FROM PAGE 67

veying, Inc. in Concord, N.H.

"For a change, the software companies are revolving their applications around and trying to meet the needs of the masses," he said.

Peterson said his company wasn't getting any more performance out of Sun Microsystems, Inc.'s SPARCstations that cost about $20,000 than from high-powered PCs from Gateway 2000, Inc. that the company purchased several months ago for about $8,000 each.

The Gateway 2000 models have 200-MHz Pentium processors and 128M bytes of RAM to handle number crunching and memory-intensive applications that churn out highway designs.

VENDORS LINE UP

Compaq Computer Corp., Hewlett-Packard Co. and Dell Computer Corp. have all committed to Pentium II-based machines that will be rolled out as PCs or PC workstations and will offer single- and dual-processor configurations.

The systems are based on Intel's new 440 LX chip set and feature an accelerated graphics port, which is key to increasing performance in a visually oriented market.

"Vendors are offering high-performance graphics at a much lower cost than RISC-based systems with all of the things that make a workstation-class machine," said Chris Goodhue, an analyst at Gartner Group, Inc. in Stamford, Conn.

Goodhue said the average Intel-based PC workstations are expected to cost about $5,000 to $10,000 vs. the $20,000 to $30,000 cost of a RISC-based machine.

But other users said Wintel-based applications aren't plentiful enough and performance isn't high enough to warrant a change in hardware platforms.

"The Pentium-based systems are coming very close in performance at the low end to RISC machines, but I'm not so sure about the stability of applications that are new and running on NT," said an information systems vice president at a large New York-based financial company who requested anonymity.

Still, lower cost coupled with standardized hardware will make the new class of PC workstations an attractive option to many companies — and new types of users, Goodhue said. □

Review: Gateway Solo 9100

CONTINUED FROM PAGE 67

area is comparable to that of a 14-in. desktop monitor, and the image may be 75% as good as a basic desktop display under decent office lighting.

Battery life was about two hours without power management features enabled.

The most interesting aspect of the Solo 9100 isn't the power, the weight or the weighty price ($5,699, with 64M bytes of RAM). It's a neatly integrated CD-ROM and 1.44M-byte floppy drive module.

Both drives fit a single bay, eliminating the need to carry extra storage devices and wires. □

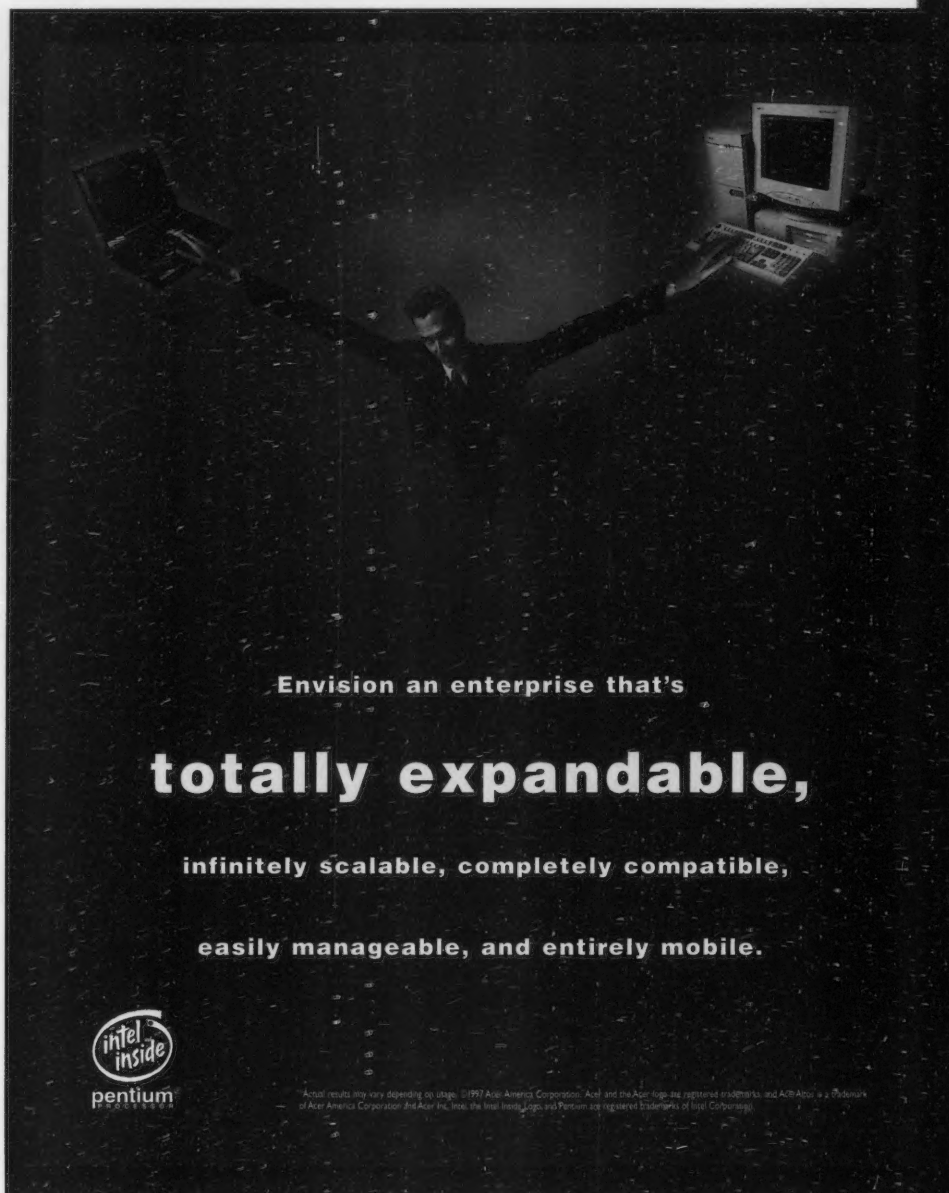
OVERALL A- GRADE

REVIEW ▶ *Solo 9100*

Gateway 2000, Inc.
North Sioux City, S.D.

Pros: Power, multimedia and integrated CD/floppy module

Cons: Weight makes it a marginal choice for many users



Panasonics pack a punch

CONTINUED FROM PAGE 67

current reminder to create setup disks. The message persists until you decide to format 35 floppy disks and insert them, one by one, into the system.

Small flaws aside, both notebooks are well-suited for their intended markets. Panasonic provides a three-year parts and labor warranty for both machines and unlimited free technical support.

CF-25

I didn't run over the CF-25 machine with an automobile (as one reviewer recently boasted he had done), but I did drop it successively onto a hardwood floor from heights of 2 to 5 feet. I also poured water on the keyboard with the power on. The notebook's sealed keyboard and hard, magnesium-alloy case defeated all attempts to damage it. Panasonic boasts that the case has 20 times the durability of a typical plastic notebook. The hard disk is packed in a polymer gel.

The CF-25 weighs in at 7.7 pounds and has well-implemented advanced power management features. Battery life was about 3.5 hours. You'll find three PCMCIA slots instead of the usual two.

I benchmarked the CF-25 as a fast performer, scoring above similar notebooks and desktop models on *PC World*'s WorldBench office productivity benchmark software.

CF-35

The Panasonic CF-35 is lightweight (only 5 pounds), fast and powerful. Its five-hour "coast-to-coast" battery life should recommend this machine as a tool for traveling executives.

The CF-35 is partially ruggedized — sturdier than the average laptop but not designed for the really rough stuff. Panasonic rates the CF-35's carbon-fiber lower case at seven times the strength of ordinary notebook plastic, but its LCD display rated at the same strength as the CF-25. The hard disk is buffered in polymer gel to absorb shock. I didn't verify the CF-35's durability by dropping it, however.

The CF-35 clocked in even faster than the CF-25 on *PC World*'s WorldBench.

The unit is enhanced by an onboard USB port, but the notebook ships with the port turned off and no CMOS option to activate it. Panasonic intends to offer a flash BIOS upgrade for CF-35 users after Microsoft Corp. ships Windows 98 with a set of debugged drivers. □

Bailes is a San Francisco-based writer. He can be reached at lennyb@slip.net.

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Acer

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www.acer.com/aac/

NEW PRODUCTS

MICRONET TECHNOLOGY, INC. has announced Advantage RAID, a self-contained desktop RAID Level 5 storage system aimed at the small business and Internet storage markets.

According to the Irvine, Calif., company, Advantage RAID houses six hard disk drives that can be swapped without cutting power, a 32-bit RISC microprocessor and a RISC-based, embedded RAID Level 5 controller.

The system is available in a 20G-byte configuration and can connect to any computer system with a SCSI port or SCSI host adapter.

It costs $6,995.

Micronet Technology
(714) 453-6100
www.micronet.com

PROCOM TECHNOLOGY, INC. has announced a 12.7mm, 3G-byte hard drive for laptop computers.

According to the Irvine, Calif., company, the hard drive is compatible with small notebooks made by several manufacturers, including IBM and Compaq Computer Corp.

Pricing starts at $1,075.

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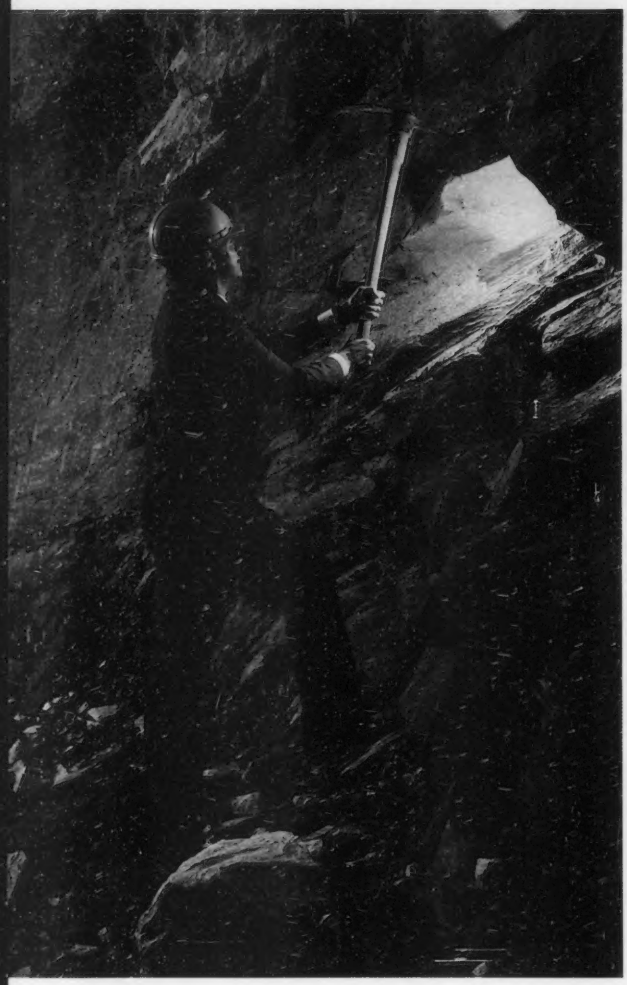

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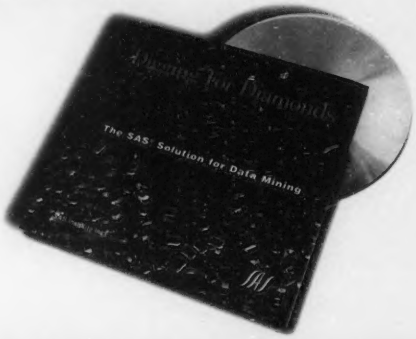

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Data Warehousing

Special Section: Data Mining • Decision Support • Strategies

Briefs

Dun & Bradstreet tools

Dun & Bradstreet Software in Atlanta plans this fall to introduce a pair of data warehousing services that will use Austin, Texas-based Evolutionary Technologies, Inc.'s data extraction tools under a deal announced last month. D&B Software, a unit of Geac Computer Corp. in Toronto, said one service will enable users of its credit and marketing databases to build subject-specific data marts. A second service will keep information in client data marts in sync with D&B Software's main databases. Pricing wasn't disclosed.

Platinum InfoPump

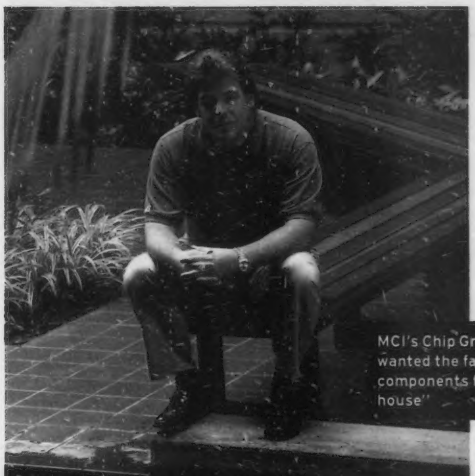
Platinum Technology, Inc. in Oakbrook Terrace, Ill., has announced a new version of its InfoPump tool for developing applications that move data between heterogeneous databases. InfoPump replicates data on servers for end-user access. It is available for Windows NT and supports major Unix and mainframe databases as well as Microsoft SQL Server. Prices start at $28,000.

Focus decision support

New York-based Information Builders, Inc. has released Focus Six Version 2, its decision-support desktop product suite. The product includes an agent that automatically partitions the processing of user queries. It also has a feature called Report Reader, which lets users distribute Focus reports via electronic mail. Pricing wasn't disclosed.

Data extraction

Apertus Technologies, Inc. in Eden Prairie, Minn., has released an upgrade of its Enterprise/Integrator tool set to develop data warehouse and data mart applications. Release 4.0 is available for Unix and Windows NT operating systems. It provides a graphical user interface based on Microsoft Corp. standards. The tool set was designed to ease the data extraction process during the building of data warehouses. Pricing starts at $125,000.



PATRICIA BARRY LEVY

MCI's Chip Grim: "We wanted the fastest of all components for our warehouse"

Storage role grows for data warehouses

▶ *Users seek optimized disk array systems*

By Tim Ouellette

LOCATION, location, location.

Users are deciding that where their data warehouse's data is stored is as important as the database and tools that surround it.

As a result, users who build data warehouses are taking more care to choose a disk array that will best fit their performance and capacity needs, instead of settling for a conventional disk array they could purchase from their server vendors.

That's because, as users start to depend more on their warehouses for strategic business gains, they know storage will be an important factor in whether users deem the warehouse a success.

Where some disk arrays are better suited to high-performance, real-time decision support, others work well in mainframe batch situations.

For example, MCI Communications Corp. evaluated disk arrays in addition to choosing database software and a server platform when it was building its consumer sales data warehouse recently.

"We wanted the fastest of all components for our warehouse," said Chip Grim, MCI's data warehousing manager. "We evaluated each piece — server, database and storage — on its own merit."

The telecommunications giant's consumer products data warehouse runs on IBM 7133 Serial Storage Architecture (SSA) disk arrays, which are RAID 5 systems that hold 7.5T bytes of data.

The selection was based on SSA's speed gains over disk systems that use traditional SCSI I/O connections. For example, in MCI's tests, SCSI arrays pumped data at 4M byte/sec., and SSA handled 37M byte/sec.

Users and analysts agree that capacity, speed, flexibility, security and software tools all play a

Storage, page 72

COMMENTARY

Seeking common ground

SHAKU ATRE

NINETY PERCENT of corporate America is stampeding to implement data warehousing, according to studies. Slow down! Not all companies need a full-fledged data warehouse to solve their most pressing problems.

There are at least two big motives for building a data warehouse: to get better information to end users faster, and to reconcile data held in disparate systems to give a unified view of the organization.

For some companies, unifying data across the business is a very important objective. And although a decision-support system can help achieve that unity, given the choice, those companies would rather unify their disparate operational systems.

Because it often seems impossible to reconcile operational systems, managers see a data warehouse as the next best way to unify the company.

Unfortunately, it is costly and challenging to build a data warehouse that spans the enterprise. Almost by default, most companies opt to create a series of subject-oriented data marts that each serve a department or business unit. Often, those data marts operate independently of one another. Thus, data marts may provide good data access, but often at the cost of the enterprise view.

If unifying the business is your goal and you can't afford an enterprise data warehouse, there is an alternative strategy.

Atre, page 72

Insurer gets a quality check on decision support

By Linda Wilson

RACING AGAINST a deadline, Blue Cross/Blue Shield of Tennessee populated an 80G-byte data warehouse in just five months last year. After the warehouse was in production, however, the insurer discovered that the data often was inaccurate or incomplete.

Now the company is on a full-scale data-quality program.

By year's end, Blue Cross/Blue Shield of Tennessee plans to implement a program to produce monthly audits of quality that will measure 50 to 100 data elements about medical encounters, members, insurance products and medical providers for accuracy and completeness. The results will be recorded on score cards and shared with people who rely on the data for analysis or control source systems

Blue Cross, page 72

LYNNE BELLUCCI

Blue Cross/Blue Shield's Frank Brooks:

"We wish we had more time to work on [quality] issues in the beginning, but we didn't"

Blue Cross

CONTINUED FROM PAGE 71

from which the data originates. The insurer also plans to find the cause of data errors and implement business process or systems changes to eliminate them.

"We wish we had more time to work on those issues in the beginning, but we didn't," said Frank Brooks, director of data resource management, who heads a 23-person staff dedicated to the warehouse, related data marts and data-quality issues. The warehouse and marts are used to analyze the costs and quality of care the insurer's managed-care enrollees receive.

Blue Cross/Blue Shield isn't the only company interested in data quality, of course. Richard Rist, vice president of The Data Warehousing Institute in Gaithersburg, Md., said, "The market is beginning to recognize that quality is key."

And for good reason. As much as 30% to 50% of the data in the typical corporate database can be missing or inaccurate, in the experience of Information Impact International, Inc., a consulting firm in Brentwood, Tenn., that helps companies devise data-quality strategies and perform audits.

Data-quality problems occur when data is moved from legacy systems to new operational systems or warehouses. Another big source of problems is within the source systems themselves, which may contain incomplete or inaccurate data.

Blue Cross/Blue Shield of Tennessee in Chattanooga imposed the five-month deadline on its $2 million warehousing project because it wanted the warehouse ready to accept data from a major new claims processing system.

Getting the warehouse running in such a short time was a huge undertaking. The warehouse, stored on an IBM mainframe, includes 5,000 data elements and 225 DB2 tables. Source data on claims, managed-care and medical providers comes from three operational systems: the mainframe running MVS, an RS/6000 running AIX and a Hewlett-Packard Co. box running Unix.

The insurer used Prism Warehouse Manager from Prism Solutions, Inc. in Sunnyvale, Calif., to transform source data into a form suitable for the warehouse and to compile meta data.

The data warehousing initiative was propelled by the managed-care environment in which Blue Cross/Blue Shield operates. The insurer is involved in managing the health care of its enrollees rather than just paying claims, as had been the case. Therefore, it needs to show customers, government agencies and trade associations information about its performance.

Data warehouse at Blue Cross/Blue Shield of Tennessee

- **Total Cost:** $2.19M
- **Size:** 80G bytes
- **Time to implement:** 5 months
- **Users trained:** 200-plus
- **Data elements:** 5,000
- **DB2 tables:** 225

QUALITY QUESTIONS

Without reliable data about costs and quality of care, Blue Cross/Blue Shield can't win managed-care contracts. "Customers are starting to ask questions about what kind of data-quality strategies we employ," Brooks said.

To start, Brooks' team must decide which data elements are most important and should be audited, monitored and scored. It also must decide how quality will be defined and evaluated.

For example, the team must determine whether data elements are entered in every field, if the elements are accurate and if they make sense in relation to elements in the other fields.

The team also is in the midst of deciding whether to purchase a specialized data-quality auditing tool or to write programs using Cognos Corp. tools.

After those issues are ironed out and quality audits are completed, the insurer will have to decide which problems to fix and in which order to fix them.

Blue Cross/Blue Shield is already fixing problems. For example, it added a rule in which enrollees aren't entered into the system without a Social Security number. That rule change was added because many members' records were missing Social Security numbers, which made it difficult to reconcile duplicate files for an individual or store all of an individual's claims in one electronic file.

Of course, the rationale behind a data-quality program isn't only to improve data, but also to provide an objective way to show users when data accuracy isn't at the root of a problem.

"In some cases, they think there is a data-quality problem, and there isn't," Brooks said. "Many times, their queries are in error, or they don't understand how to use the data." □

Wilson is a freelance writer in Glen Ellyn, Ill.

Atre: Seeking common ground

CONTINUED FROM PAGE 71

We call it the "consolidation" warehouse. Like a standard data warehouse, a consolidation warehouse brings together and transforms data from multiple data stores into a single logical database. The key difference is that the consolidation warehouse is intended to serve primarily as a "common ground" to bring together transaction-level data spread across disparate systems. The other key difference is the primary use of this data store. At least initially, the data store is used primarily as a central data source for applications. It isn't used for end-user querying purposes.

PUTTING IT TO WORK

In a recent consulting engagement, we helped a large law firm implement a consolidation warehouse. This organization has six major operational systems that don't talk to one another.

To connect each data source to every other would require 25 connections, or transformations. By establishing a consolidation warehouse that connects to each data source, only six connections are needed.

The law firm saw its priorities clearly: first, get a handle on incompatible data with a consolidation warehouse; then, in a second phase, work on giving end users access to the consolidation warehouse for analysis.

An example will illustrate the value of this law firm's consolidation warehouse. A new application, developed in Lotus Notes, will track lawyers' professional education requirements.

Prior to the consolidation warehouse, the data for Notes would be extracted from a SQL Server-based human resources database, then restructured for the nonrelational Notes structure and stored in Notes.

That is problematic because it takes significant effort to reformat relational data into the proprietary structure of Notes. Also, the human resources and the Notes database would quickly get out of sync as changes were made to each, because there is no easy way to do updates.

With consolidation warehouses, data is copied from its origin (the human resources database) into the common consolidation warehouse database. From there, via an appropriate data transformation tool (in this case, Platinum Technology's InfoPump), the Notes database can be updated and new records added on a regular basis.

The consolidation warehouse strategy can be much simpler to deploy than an enterprise data warehouse strategy.

You don't need to create aggregations or roll ups, because all applications require transaction-level data.

NO DEBATING

You don't need to debate about whether to use a star schema or a denormalization approach, and you don't have to worry about online analytical processing (OLAP)/relational OLAP, multidimensional databases, cubes and so on. From a design and implementation perspective, a consolidation warehouse is much less complex than a data warehouse.

That will help you stretch the implementation dollar, perhaps enough to embrace the whole enterprise or at least enough to address the key applications that need to share data. □

Atre is president of Atre Associates, Inc., a consulting company in Port Chester, N.Y., which specializes in data warehousing and database technology. She can be reached at shaku@atre.com.

Storage

CONTINUED FROM PAGE 71

part in choosing the right disk system for a data warehouse.

Vendors are responding with more specialized disk arrays that target this booming market, with microcode optimized for various vendor databases.

For example, Hitachi Data Systems Corp. in Santa Clara, Calif., recently rolled out the Nucleus Series, which specifically targets data warehouses.

The product is a bundle that includes HDS's 5700 disk array, a special controller powered by a Digital Equipment Corp. Alpha chip and software optimized to move data requests back and forth quickly.

The results of any of those arrays can be tempting.

HCIA, Inc. turned to Sun Microsystems, Inc.'s latest RSM 2000 array, which targets high-end Unix systems.

Because the array handles security right inside the box rather than from the database server, it frees up the server to handle more requests, and it speeds the return of data to users.

"We have over 5T bytes of disk storage in our warehouse spread over 10 servers. But people have really noticed that performance has improved with the RSM 2000," said Peter Wagner, director of systems and networks at HCIA, a health care information provider in Baltimore.

When Enterprise Marketing Services, Inc. expanded its data warehouse to more than 100G bytes, it replaced a Compaq Computer Corp. disk system with a RAID 7 Storage Server, a fault-tolerant system from Storage Computer Corp. in Nashua, N.H.

The firm was able to increase its data warehouse from 40G bytes to 100G bytes and triple its I/O speeds — without a failure in the process.

FAILURE FREE

"Since switching, we have never had a failure that could bring the system down — our data has never been inaccessible," said Rich Horbaczewski, director of systems development at the Naperville, Ill., direct marketing firm. The data warehouse contains massive direct marketing lists and telephone number data used by EMS's clients.

Still, users should be ready to pay a premium price — $500,000 to $1 million is to be expected. But the price may be worth the time and effort.

"Data warehouse expansion will never slow down," Grim said. "And because we are pumping so much data through the data warehouse, we need the disk system to be as fast as it can be." □

What Data Warehousing Experts Are Saying About Red Brick. . .

"Red Brick Warehouse 5.0 helps Red Brick solidify its lead among RDBMS vendors in the data warehouse space." *Patricia Seybold Group*

". . . Red Brick is the technology leader among the open systems data warehouse RDBMS vendors." *Giga Information Group*

"We believe Red Brick is the best DSS/OLAP platform for real-time, random query access of larger data sets . . ." *META Group*

". . . we estimated Red Brick to have between a 12 and 18 month lead." *UBS Securities*

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Randy Mott, Senior Vice President and CIO, Wal-Mart

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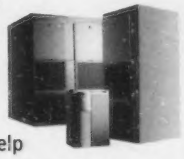
NCR Teradata is the only parallel database reliable and robust enough to handle this kind of load. And our NCR WorldMark servers are the only platform that scales from SMP to MPP, allowing businesses to start their data warehouse small and grow it to any size.



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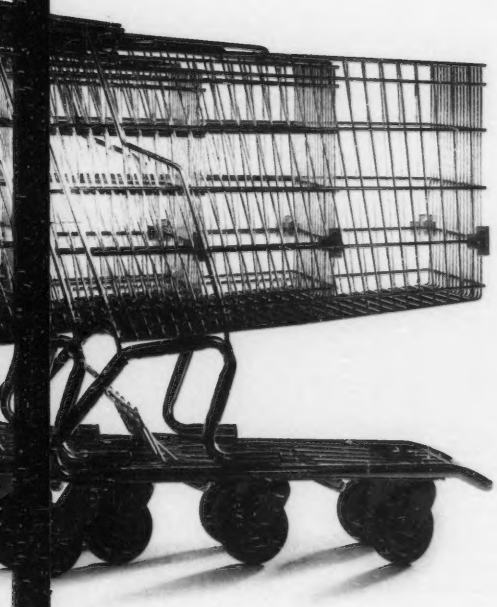

NCR

Transactions in the Age of the Consumer

DEAR CEO: WELCOME TO 2001; SEE YOU IN COURT!

PETER G. W. KEEN

Think the IS labor shortage is a problem today? Just wait until the coming year 2000 legal crisis starts siphoning off your IS staff.

Information systems professionals will be routinely subpoenaed in the court cases brought against CEOs for negligence in handling the year 2000 issue.

Other IS pros will leave for the lucrative new business of providing expert witness testimony. Still others will be consultants to law firms and perhaps part of the CEO's defense team.

The cases will focus on the same questions that dominated the Watergate and Iran-Contra hearings: "What did the president know and when did he know it?" But the extra question for "Millenniumgate" will be, "And what did the president then do about it?"

CEOs won't be able to plead that they weren't informed of the issue; ignorance won't be a plausible defense. They will have to show that, once informed, they personally acted as leaders in a business crisis: that they sanctioned the full, needed investment for the technical work, ordered an in-depth business risk assessment (economic, safety, organizational, supply chain, contract performance and the like) and put in place a contingency plan to handle any crisis created by the year 2000 fallout. The minutes of their top management meetings and boards of directors meetings will be scrutinized for evidence of the attention they paid and the progress reports they routinely got.

The court cases brought by shareholders, customers, insurers, lenders and employees (who lose benefits payments for a few months or their health care insurance), will be less about the damage from failures to fix the date problem than about accountability. CEOs can argue in 2001 that it isn't their firms' fault if they couldn't meet contracted deliveries of parts because European or Japanese trading partners' systems crashed. But that excuse won't wash. The lawyers will be asking, "Did you show due diligence in risk assessment, contingency planning, monitoring and investment?"

RISING TO THE CHALLENGE

My estimate is that about 30% of CEOs will be able to show that they met the business responsibility here in the U.S. But in Europe, the figures are dreadful. More than 90% of the CEOs I work with there find the entire millennium issue irrelevant. They don't know much except that it's big, they don't know what their CIOs are doing about it, and they're all still looking for ways to cut IS costs.

Computing Japan reported in its June issue that very few executives there are knowledgeable about the year 2000 problem. Only an estimated 30% of Japanese programmers have the skills needed to deal with old Cobol code, much of which includes English terms. Just about every large U.S. firm does business with European and Japanese companies. How they handle the year 2000 problem is now part of your own company's business risk profile.

Year 2000 isn't a computer problem anymore. It isn't a company, industry or U.S. problem either — it's a global interdependency problem. Even if an individual company manages to locate, change and test all the needed fixes in its system, it will be affected by other firms that haven't done so. That's an inevitability — the consequences may be trivial or massive, but it's the job of the CEO to mobilize to prevent the crisis from becoming a disaster.

IS has to get that across to senior businesspeople. The lawyers are ready and waiting. A lawyer recently told me that the profession is salivating at the forthcoming opportunities and that, already, insurance firms are refusing to issue liability insurance that covers outside directors against year 2000-related lawsuits. That lawyer's estimate of the total year 2000 liability is at least $1 trillion.

Perhaps the next new job title is going to be CLO — chief litigation officer. □

Keen can be contacted at www.peterkeen.com. His new book, The Process Edge: Creating Value Where it Counts, *was published in June by Harvard Business School Press.*

f.y.i.

When less is better

When IS architects think of scalability, they usually think of how well applications will work if you throw more users, more data or more transactions at them.

But as companies go global, they need applications that can be scaled down so they can be deployed cost-effectively in, say, a new two-person office in Shanghai.

For example, TransCanada Energy Ltd. in Calgary, Alberta, wants a single, corporatewide accounting system to give business managers the most accurate financial data and to get the benefits of common business processes. But, like many other companies, TransCanada also is opening new, small offices overseas and acquiring other companies.

Therein lies the rub, says IS manager Trekker Armstrong. "One business unit could afford a $200,000 implementation" of an accounting system, he says, and that same price would cripple profits at a smaller, start-up business unit. Because small offices can't afford their own technical staff, he says, such "downwardly scalable" systems must also be simple enough for users to manage.

A small-office solution has to be simple enough, Armstrong says, that a nontechnical user "can come in in the morning and know their backups are running, and they know how to troubleshoot their clients or hopefully, their clients don't give them any problems" in the first place.

Armstrong is still trying to figure out how to shoehorn TransCanada's accounting system into smaller offices and how to split the cost of systems that are crucial for the overall company but huge cost burdens on small offices. Allowing those smaller, remote offices to collaborate with other offices requires systems "that can be scaled down or can be well integrated with other products" to share data seamlessly, he says.

The same is true for other corporate systems. "We have liaison offices in the international area where they have a requirement not only for the traditional file and print" services available on a LAN, but also for all other applications that let those offices collaborate with other TransCanada units worldwide, he says. "Then you're into calendaring, into mail . . . and you need a solution that can [range from] an enterprise to a department to a small-office type of solution."

— Robert L. Scheier

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SPECIAL REPORT

SOFTWARE QUALITY

The bugs in Denver International Airport's baggage-handling system cost the Mile High City a cool million a day. But you don't have to blow it big for poor software quality to cost you a fortune. Your company is probably losing business and wasting time and money on avoidable rework and help desk calls. And IS is as much to blame as any vendor.

And yet many companies are putting quality on the back burner. "If speed is what matters most," the thinking goes, "a few bugs are better than slow-footed processes."

Your company depends on IT to stay in business. Can you afford that kind of thinking?

That's where our Special Report begins:

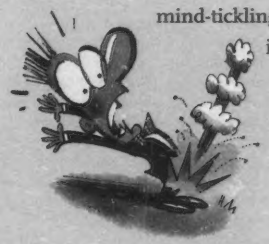
- **Overview:** Poor quality is costing you plenty. We look into the real costs of software quality and show how quality more than pays for itself. *Page 78.*

- **Sound off:** Two experts tackle an uncomfortable question: Is the quality we're getting from software vendors good enough? *Page 82.*

- **Resources:** Web sites, events and books for the quality-minded. *Page 87.*

- **Careers:** Quality professionals make up only 3% to 5% of the software jobs in the U.S., yet there's evidence that demand is surging. *Follows Resources.*

All this and our savory blend of buzzsaw statistics, mind-tickling quotations and why software is like an exploding shoe.



HAL MAYFORTH

EDWARD CISEL

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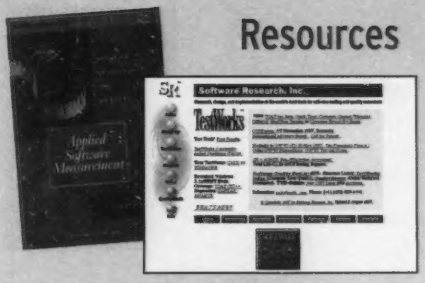
LYNNE SILIS

Sound Off



Resources

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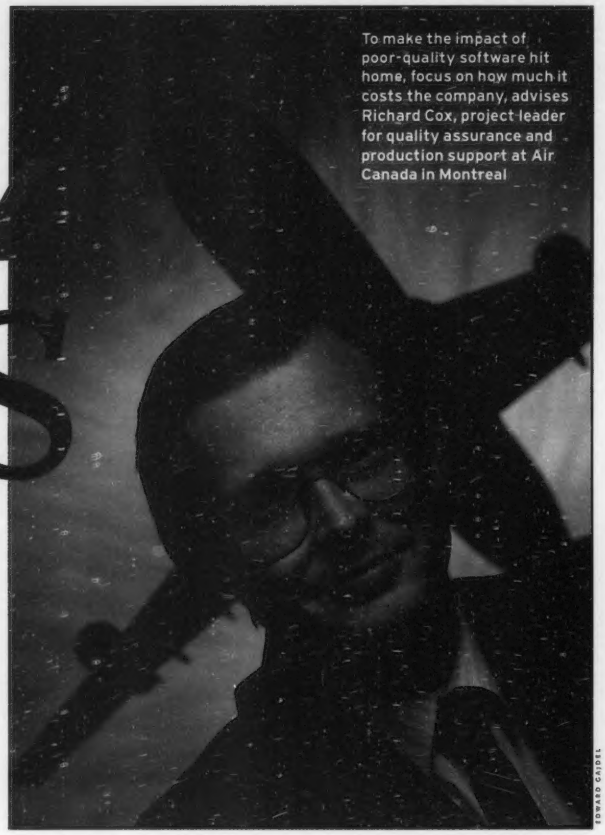
Overview

QUALITY Pays

Poor-quality software costs a bundle in money, lost opportunities and irritation, but it costs less to fix than you think

By Miryam Williamson



To make the impact of poor-quality software hit home, focus on how much it costs the company, advises Richard Cox, project leader for quality assurance and production support at Air Canada in Montreal

TADEUS CZAPSKI

IT WAS THE Bug That Ate Denver International Airport.

Faulty baggage-handling software delayed the airport's opening 16 months, from October 1993 to February 1995. Newspaper accounts at the time told of "bags [that were] literally chewed up," and "clothing and other personal belongings flying through the air." The delay cost airlines and the city of Denver $1 million dollars per day, not including litigation, according to Capers Jones, chairman of Software Productivity Research, Inc. in Burlington, Mass.

For Tony Bilotti, the problem of software quality hit closer to home. There was a barrage of telephone calls to the help desk. Branch managers demanded to know, "What am I going to tell these people?" The software bug cost his former employer $300,000.

facts & stats

ILLUSTRATIONS BY HAL HAYFORTH

Fifty percent of software costs are directly attributable to error corrections.
Source: U.S. Department of Defense

About 67% of the companies that responded have a formal testing or quality assurance department, but 20% of those companies don't get involved in the development process at all and only begin testing code when it is complete.

Eight percent of companies release software to beta sites without any testing. And 92% percent do some kind of testing, but the majority of that testing is informal.

Only about 20% of those that do any testing perform formal, rigorous testing.

Eighty-three percent of organizations' software developers don't like to test code. Fifty-three percent of organizations' software developers don't like to test their own code because they find it tedious. Thirty percent don't like to test because they find testing tools inadequate.
Source: A 1996 survey of 240 Fortune 1,000 companies in North America and Europe commissioned by CenterLine Software, Inc., a software testing tool and automation company in Cambridge, Mass. The survey was conducted by an independent market research firm. The companies surveyed were selected at random from more than 300 firms.

"Programming today is a race between software engineers striving to build bigger and better idiot-proof programs, and the universe trying to produce bigger and better idiots. So far, the universe is winning."
— Rick Cook, mission manager, NASA Mars Pathfinder project

"I know not a single less relevant reason for an update than bug fixes. The reason for updates is to present new features."
— Bill Gates in Focus, *a German magazine*

PHOTOS BY DAN MCCOY-WADE

Faulty baggage-handling software delayed the opening of Denver International Airport for 16 months

"We were out of business for a day. The 2,000 independent agents who used Continental Insurance Co.'s policy-writing system couldn't quote on our policies. A lot of new business we could have had went somewhere else," says Bilotti, now associate director of quality assurance at Phillips-Van Heusen Corp. in Bridgewater, N.J.

Perhaps your company hasn't experienced a disaster such as this, but the bite poor software quality takes from your bottom line is nothing to sneeze at. According to Jones, nearly half the money a typical company spends on software development pays people to clean up after themselves or one another, and that's a nice chunk of change that could be better spent elsewhere.

That kind of waste might make executives think of jumping out of their corner-office windows — if they knew about it. But corporate executives have no idea what's going on in software development, and information technology executives know little more. "Even the [quality assurance] people don't know very much," Jones says. In a June study for Meta Group, Inc. in Stamford, Conn., Howard Rubin, professor and chairman of the department of computer science at Hunter College of the City University of New York, surveyed 873 companies in industries ranging from aerospace, financial services and discrete and process manufacturing to software producers, telecommunications and utilities. Although most had undergone some assessment of their software processes, more than two-thirds had no formal processes, and fewer than one in five kept any data on software quality.

FOCUSING ON COSTS

Technology leaders can exert real bottom-line impact by focusing on cutting costs that result from poor-quality software, experts say.

The first step is to assess those costs, says Richard Cox, project leader for quality assurance and production support at Air Canada in Montreal. "You've got to count software defects, measure the impact of those defects and figure the cost and time required to fix them," he says.

But the impact of software errors goes far beyond the cost of rework. Loss of revenue, missed market opportunities, incorrectly processed orders and billing errors all drain money from the business. Then there's the cost of customer dissatisfaction, intangible but real, to be accounted for.

And consider the cost of maintaining a help desk. "The more you push out to internal customers products that aren't completely reliable, the more likely it is that the help desk will be swamped," says Lawrence H. Putnam Sr., president of Quantitative Software Management, Inc. in McLean, Va.

With quality in its current state, the average software company needs "at least one live help desk person for every 100 customers for each application package," Jones says. That number may be smaller for information systems organizations that serve internal customers. And of course, not every call to technical support is triggered by a software fault, but help desk logs should easily pinpoint the proportion that are. If that number was significantly reduced, then some of the technical staff could move on to revenue-producing work. And the people currently seeking help wouldn't be tied up waiting for a solution — more savings in time and money.

As important as measuring software quality is, many managers say they lack funding to institute a measurement program. To Cox, that's a nonissue. "This isn't rocket science," he says.

When he came to Air Canada, the IT staff was tracking software problems on a Quattro Pro spreadsheet. "That's ridiculous," Cox says. "There was no way I could give any kind of visibility to management without spending hours doing statistics on a spreadsheet." Cox gave the job of developing a dBase III defect-tracking application to a new hire just out of high school "who loved to play with the PC." What had taken half a workday to monitor could then be done in an hour.

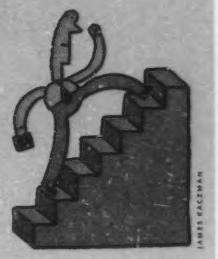
Cox found that half of all software errors showed up during acceptance testing or production, so he souped up testing earlier in the development process. The cost was negligible, but the benefits were readily discernible. Gratified management increased the quality assurance staff from one to four, and Cox was in charge.

Concern for software quality should extend beyond the quality assurance staff. Educating IT professionals in the importance of quality costs nothing and can quickly yield beneficial results. At Phillips-Van Heusen, whose product lines include Van Heusen and Izod shirts and Bass shoes. Bilotti draws an analogy between a defect in a product that renders it unsalable and a defect in software, which also adversely affects the business. He suggests calculating how many units of a product or service

Quality pays, page 81

6 steps for software quality

Quality experts suggest taking the following steps to improve software quality:


JAMES FACEMAN

- **Set up a measurement system to see how you're doing now. Pick a few typical completed projects. Calculate time, effort, errors and time to fix.**
- **Document your current development process, no matter how chaotic it may be.**
- **Figure the cost of fixing software errors in terms of goods or services your company sells. Publicize this cost throughout the IT organization.**
- **Do what it takes to eliminate errors in requirements and design. Interview users and managers carefully and check back with them to be sure you've understood what they need. Let them see design prototypes. You'll recoup any added expense in the rest of the development process.**
- **Test early and often. Start test planning as soon as the requirements are complete. Test modules as you develop them; don't wait until they're integrated. A good test suite tries to prove that errors exist, not that they don't.**
- **Recognize that process improvement is an ongoing effort, not something done just once.**

"Imagine if every Thursday your shoes exploded if you tied them the usual way. This happens to us all the time with computers, and nobody thinks of complaining."
— Jeff Raskin, Apple Computer, Inc.

Definition of software quality:
1. The totality of features and characteristics of a software product that bear on its ability to satisfy given needs; for example, conform to specifications.
2. The degree to which software possesses a desired combination of attributes.
3. The degree to which a customer or user perceives that software meets his or her composite expectations.
4. The composite characteristics of software that determine the degree to which the software in use will meet the expectations of the customer.
Source: Institute of Electrical and Electronics Engineers, Inc.'s *Standard Glossary of Software Engineering Terminology*

Definition of software quality:
The ability of a software product to satisfy its specified requirements.
Source: U.S. Department of Defense

Sixty percent of all large corporate IS budgets are devoted to the correction of erroneous or questionable Cobol code.

Where do software problems come from?
Insufficiently understood requirements: 50%
Design not understood or incorrectly translated from requirements: 30%
Coding (programming error or misunderstood design): 20%
Source: *Software Quality*, by Mordechai Ben-Menachem and Gary S. Marliss

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More than 50% of software technical staffers and 70% of software managers are poorly trained in quality control.
Source: Software Productivity Research, Inc., Burlington, Mass.

More facts & stats, page 81

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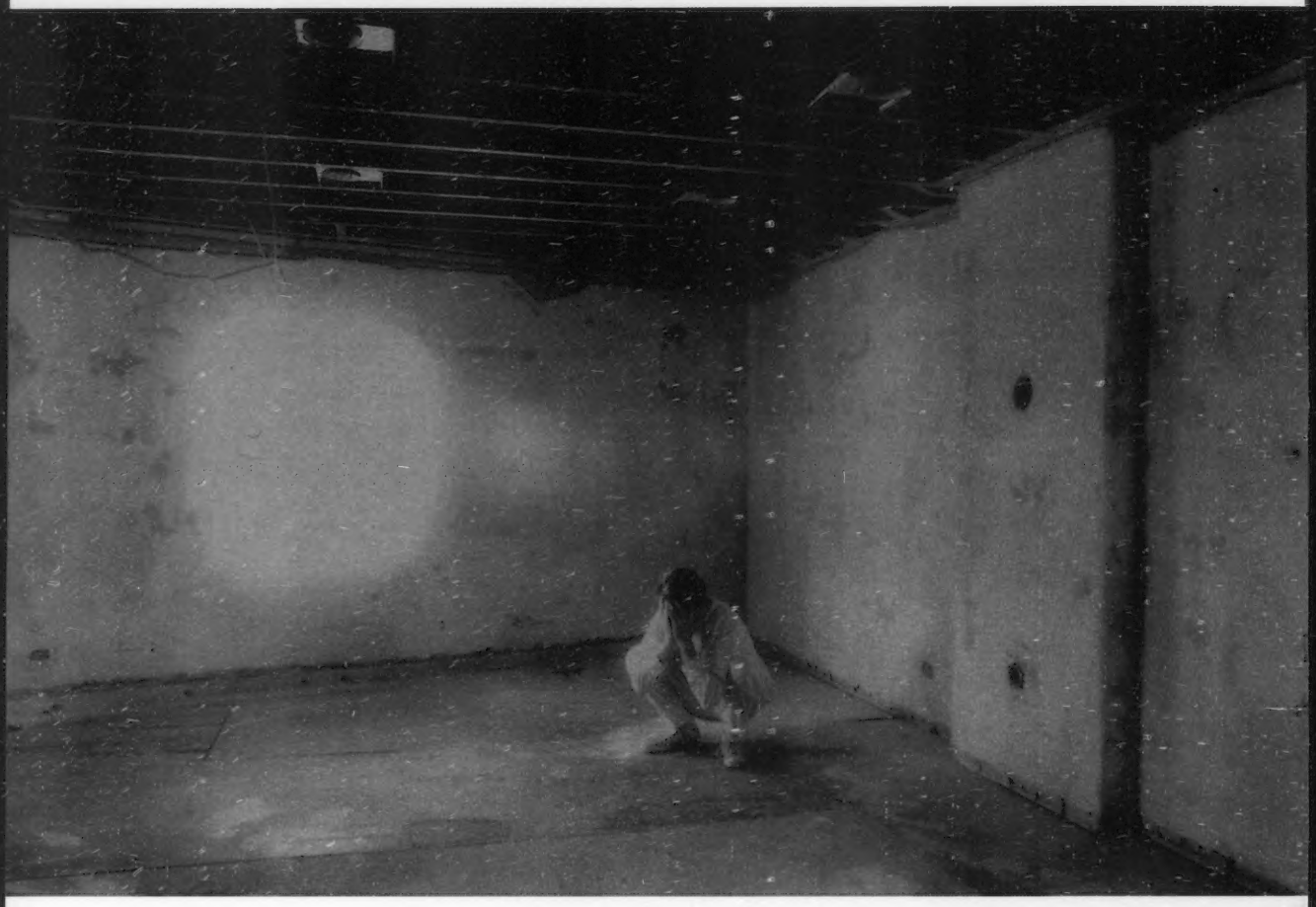

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Quality pays

CONTINUED FROM PAGE 79

must be sold to cover the cost of rework on a software error and publicizing the figure among the development staff. "Once you show people statistics and provide ways to improve software quality, people gravitate to those things and do them. You don't have to hold a gun to their heads. People don't come to work to do a bad job. They want to become more professional and develop better software," Bilotti says.

It's true that there are tools that can help improve software quality. At most, Putnam says, a company might choose to increase its development spending by 10% or 15% to acquire such tools and train people to use them, but the savings in rework and other error-associated costs would soon make up for that increase. "It's not a matter of huge investments. It's a matter of careful planning and disciplined feedback," he says.

Improving software quality isn't something that happens once and it's done. Nor is it a matter of making one change in the development process and thinking the quality problem is solved. "It's like getting into good physical shape," Bilotti says. "You don't just exercise once and forget about it. It's a continuous process. You make it a way of life." □

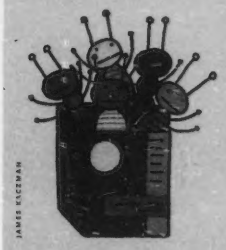
Williamson (mwilliamson@reporters.net) is a technical journalist in Warwick, Mass.

Box full o' bugs

No matter the price, poor-quality commercial software is no bargain.

Commercial software vendors last year fielded 200 million calls for technical support, says Cem Kaner, author of *Testing Computer Software* (Thomson Press) and a frequent speaker on software quality and customer satisfaction.

"At an average of about $23 per call, the industry spent about $4.6 billion on these calls," 38% of which were because of bugs, says Kaner, who gathered statistics on poor quality in shrink-wrapped software for a forthcoming book, *Bad Software*.



JAMES KACEMAN

But vendors aren't the only ones who pay for poor quality. At the other end of the support line in most cases is someone's employee, who is kept from productive work for an average of nearly 20 minutes per call. "There are so many bugs in mass-market software because it's normal practice in the software industry to leave some bugs unfixed," Kaner says. He quotes James Bach, author of *The Challenge of 'Good Enough' Software* (Software Test Labs, 1996) as saying, "I was working at Apple when Macintosh System 7.0 shipped . . . with thousands of bugs." And author Edward Yourdon, in his book *Rise and Resurrection of the American Programmer* (Prentice Hall), writes: "Industry scuttlebutt informs us that Microsoft Windows 3.1 was shipped in 1992 with some 5,000 known bugs."

But before in-house developers start feeling superior, they should consider this: Kaner says that although mass-market vendors commonly find 95% of software defects before their customers do, testing effectiveness for software developed for in-house use is commonly as low as 50% to 75%. — Miryam Williamson

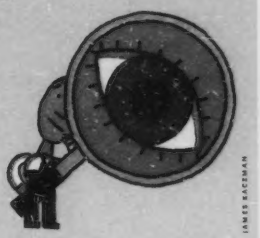
Inspect before you program

Quality control saves the most money when it's done at the start of the software development process.

It shouldn't surprise you that errors caught early in the software development process are easier and less expensive to fix than those found later.

In his 1981 book *Software Economics* (Prentice Hall), Barry Boehm says a defect that takes one hour to correct when system requirements are being defined will take at least 100 hours if not discovered until the system is in production. That's a strong argument for placing quality improvement emphasis on the front end of the process.

An enthusiastic practitioner of this principle is Gregory T. Daich, senior test engineer at the Software Technology Support Center at Hill Air Force Base in Utah, which develops software for national security and weapons systems. Daich and his team put requirements documents (which list the requirements for each system to be developed) under a high-powered microscope before the designers get into the act.



JAMES KACEMAN

As the first step in a document inspection, the team leader gives the work a quick once-over. If more than a few errors are found, the document goes back to the author — usually technical writers — to be reworked.

Documents that pass the initial examination are subjected to more thorough scrutiny. Each requirement must be supported by a source document that explains the problem to be solved or a task the system must perform. And feasibility and prototype studies may also be included.

The hardware platform and test environment must be specified at the requirements phase. Documents produced at each stage must refer explicitly to those from the previous one.

When the time comes for programming, developers can be confident that everything possible has been done to eliminate errors. That doesn't mean that project documents are assumed to be perfect, Daich says.

"After we remove the defects we can find, we estimate how many remain based on past software project experience," he says. Given the complexity of today's software, no one expects absolute perfection.

Daich says inspections proceed at "somewhere around one page an hour. Any faster than that, and you can't possibly do all the consistency checking with the source documents, rules and standards that we are trying to follow."

He estimates that inspections add 15% more time to the early stages of development. But the savings are greater than that. "You don't have much rework time, and testing time can easily be cut in half. You can see benefit right away," he says.

And to those who say they're too tied up in year 2000 conversions to address the quality issue now, Daich has a ready response: "That's ridiculous. You don't have time not to." — Miryam Williamson

facts & stats

"Testing can only indicate the presence of bugs, not their absence." — *Edsger Dijkstra, University of Texas at Austin*

A majority of respondents admitted that their organizations have knowingly shipped software with bugs.
Source: The 1996 CenterLine survey

"Microsoft programs are generally bug free . . . 99.9% [of calls to the Microsoft hot line] turn out to be user mistakes." — *Bill Gates in* Focus, *a German magazine*

"The most likely way for the world to be destroyed, most experts agree, is by accident. That's where we come in. We're computer professionals. We cause accidents." — *Nathaniel Borenstein, chief scientist, First Virtual Payment System*

From 1987 to 1995, six patients were seriously injured or killed by unsafe administrations of radiation from the Therac-25 medical linear accelerator. Software interface errors were blamed.

General Motors Corp. last July had to recall nearly 300,000 cars because of a software flaw that could cause an engine fire.

More facts & stats, page 82

Sound Off: Should we give up on yes!

Today, speed is everything; IS will gladly trade a few bugs for fast releases

By Steve Devinney

SO THE TOPIC is quality. Let's review the IS track record.

According to a study by The Standish Group, 52% of all projects undertaken by internal IS organizations cost 189% of their original estimates; projects completed have 42% of the originally proposed features or functions; 81% of all projects are canceled before completion; and only 16% of projects are completed on time and within budget.

That isn't a difficult record for software vendors to beat. Vendor packages may be the only hope the U.S. has of maintaining a strong position in today's competitive marketplace. (I'm not implying that all IS departments are incapable of producing quality software, just pointing out that IS faces problems that make vendor packages even more appealing.)

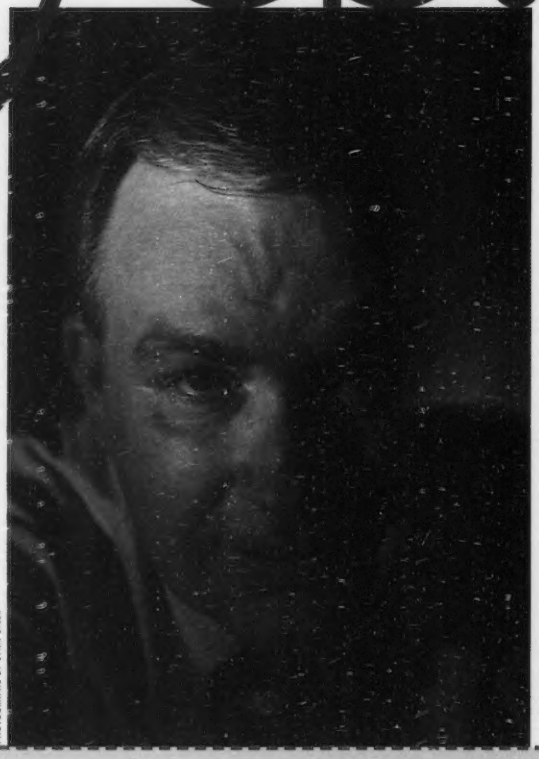
Why is vendor software more attractive in today's competitive marketplace?

To begin with, quality isn't as bad as everybody says. Vendors subject their products to beta testing. That gives hundreds, or even thousands, of people the opportunity to identify defects and gives the vendor time to remedy critical defects prior to a formal product introduction. Corporate America can't subject homegrown applications to that level of scrutiny.

Let's face it: Vendors focus primarily on the critical business functions their products were designed to support. Hence, their products' defects may be more of a nuisance than a serious roadblock. That isn't an excuse for poor interfaces or nonintuitive design, but at the end of the day, the important thing is to get your job done.

Corporate America and corporate IS have come to expect and accept defective products. "So we missed a deadline and our application is defective. The users signed off, and we still have a job. Life couldn't get any better." Vendors bet their company on every introduction or major enhancement. One catastrophic deployment may well be the last. How long will a vendor stay in business if it delivers only 42% of the promised functionality?

Yes! page 84



PHOTOGRAPHS BY LYNN SILLER

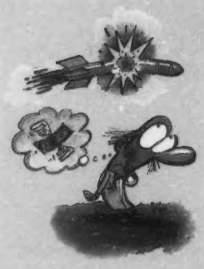
facts & stats

ILLUSTRATIONS BY HAL MAYFORTH

"Truth comes out of error more easily than out of confusion."
— Francis Bacon

Twelve percent of companies have faced liability or litigation issues with regard to direct or consequential damages from lack of software quality.
Source: A 1996 survey of 240 Fortune 1,000 companies in North America and Europe commissioned by CenterLine Software, Inc., a software testing tool and automation company in Cambridge, Mass. The survey was conducted by an independent market research firm. The companies surveyed were selected at random from more than 300 companies.

In June 1996, the European Space Agency's Ariane 5 made its maiden voyage. Thirty seconds after liftoff, a part of the guidance system that had been cribbed from Ariane 5's predecessor failed. Loads became intolerable, and the launch vehicle self-destructed. Ariane 5 cost more than $7 billion and took nearly 10 years to develop.



Root causes of poor software quality:
1. Inadequate training of managers and staff.
2. Inadequate defect and

quality vendor-supplied software?

no!

IS has settled for defective software long enough. It's time to hold vendors' feet to the fire

By John W. Horch

IT'S NICE TO HAVE the latest features in your software, but it's time IS demanded the greatest as well. We don't give up when we're not satisfied with other products. Why should we give up on software?

Sociologists say that we're moving toward the median of mediocrity. We're becoming tolerant of "good enough," of "almost right." After all, *most* airplanes don't crash. *Most* bungee cords don't break. *Most* of my roof doesn't leak. And hey, *most* of the time my software runs.

Thus was born good-enough software.

It's fine to get the latest version of a slick electronic-mail program, but when it crashes your system every third or fourth time you use it, time is lost, and stress builds. Does it matter that your word processor can place 15 fonts on one page when it can't reliably reposition a table? How many two-minute interruptions from crashes or freezes, how many 10-minute work-arounds and how much aggravation will it take to persuade us to choose another less powerful but more useful software package?

I sent back the latest upgrade to my E-mail provider and went back to a better, previous version. It does what I *need*, not what the vendor wants to *sell*.

Twenty-five years ago, the U.S. automobile industry got a wake-up call when Toyota, Honda and Nissan invaded the marketplace. Suddenly, good enough wasn't. The time is ripe for another wake-up call — this time for software vendors that think there's no alternative to their overpriced, overvalued and underperforming offerings. It's time to quit settling for what we used to call the IBM answer: "I know what you want, but this is what you get."

Are you really willing to spend time rebooting because of a system error? Do you really not mind the extra connection charges that accrue while you try to get the modem off-line and reset? Is it OK to lose 10 minutes of work because a conflict between two applications causes a crash? Is it acceptable to risk a nuclear incident because of mishandled alarms?

No! page 84

cost measurement.
3. Excessive schedule pressure.
4. Insufficient defect removal.
5. High complexity levels.
6. Ambiguous and creeping requirements and design.
Source: *Software Quality: Analysis and Guidelines for Success*, by Capers Jones (1997, International Thomson Computer Press)

Sixty-nine percent of companies don't have a measurable, repeatable software testing process.
Seventy-four percent of companies say the best way to meet software quality demands is to "build a process that sets goals and [begins] testing in the beginning of the development life cycle."
Source: The 1996 CenterLine survey

Where is software maintenance time spent?
Code analysis: 47%
Testing and debugging: 28%
Coding: 19%
Documentation: 6%

Source: *Software Quality*, by Mordechai Ben-Menachem and Gary S. Marliss

---

The Social Security Administration last year determined that 700,000 Americans had been rooked out of more than $850 million in retirement benefits because of a software error that miscalculated benefits for people who continued to work after they began collecting Social Security.

There are 0.5 to 0.6 defects per 100 lines of code during software development. There are 1.5 to 1.6 defects per 100 lines of code during software maintenance.
Source: Generally credited to Tom DeMarco

More facts & stats, page 84

Yes!

CONTINUED FROM PAGE 82

Consumers have demonstrated that speed of delivery and cost are far more important than defect-free products

Is vendor software defect-free? Of course not. Why? Vendors are especially sensitive to time-to-market demands. The competition is plentiful, and new players join the game every day.

Look at the evolution of year 2000 technology solutions. Three years ago, there were a few vendors that offered technology assistance. Today, everybody who can spell year 2000 has some form of automated solution. Speed of delivery is critical to vendors, and it may ultimately be the deciding survival factor. Vendors can't simply focus on the current market needs; they must stay abreast of new technologies and position themselves to be the leaders of innovation.

Consumers have repeatedly demonstrated that speed of delivery and cost are far more important than defect-free products. We continue to buy their products, services and maintenance contracts. There was a period when we expected vendor software to exceed the quality of the products IS could produce. Now we tell vendors we will tolerate defects as long as their software meets the critical needs of our core business functions. In effect, we have lowered the product quality standards for the vendor.

So whom do we blame for defective software? Vendors will react to the demands and expectations of the consumer community and will continue to deliver defective products until we raise our quality expectations and refuse to buy defective products. Today, you buy a product knowing it has defects but with some assurance that a fix is forthcoming via a World Wide Web-enabled file transfer or a new release. You're happy. The vendor's happy.

Of course, there are exceptions. Microsoft has such a stranglehold on the desktop market that it can force consumers to accept defective products.

Vendor software will always be an attractive solution for most organizations. New and advanced technologies, the global marketplace and the dwindling availability of technical resources will continue to fuel the need. What you give up in quality you'll get back in convenience and frequent releases.

Me, I'll take the a:\install any day.□

Devinney is managing director of the Quality Assurance Institute in Orlando, Fla. He can be reached at 76435.44@compuserve.com.

No!

CONTINUED FROM PAGE 83

Can your shop overlook a one-year schedule slip because the software wasn't as represented?

After three months of trying to use an upgraded version of one of the most popular word processors, one of my clients, a software developer with 500 employees, returned 200 site licenses and reverted to the previous version. (When I am required to submit my reports in that particular word processor, I add 25% to my fees.) Another client, a major electric-power company, removed a vendor because of flawed software that caused a near-failure at a nuclear power generator. Still another client, a metropolitan railway system, dropped a vendor after the vendor's software — presumably a customizable off-the-shelf package — had to be completely redesigned to meet the needs of my client. The vendors heard those complaints!

Has IS lost the self-esteem that once told us we were worthy of goods that worked?

You don't do sloppy work. Your time is as valuable as anyone else's. Your right to get value for money is legitimate. Have corporate IS organizations lost the self-esteem that once told us we were worthy of goods that worked, lasted or were safe? Are we so resigned to *good enough* that we've lost the heart to demand *better than expected*?

One thing you can do is determine what you actually need in a vendor-supplied software product. Shop around. Few needs are so immediate that you must run out and buy the first thing you see. If you shop around, you'll find that there's more than one source for nearly everything.

Sure, there are a few giant vendors out there, but few of them are the only vendor of a particular software product. Which package does what you *need*? Forget the bells and whistles. Stop buying software just for the sake of having the newest or biggest. If you don't need the added capabilities, don't pay for them. If you aren't satisfied with what you do buy, send it back, and don't use that vendor again.

To settle for good enough is to sink to the bottom. I don't want to, and I don't think we have to. We've settled long enough.□

Horch has spent more than 30 years in the field of software quality assessment and assurance. Currently a consultant, Horch speaks at international conferences, symposia and workshops. He has published numerous papers on software quality management topics, refereed submitted papers for conferences and journals and reviewed books for several technical magazines. He wrote a book on software quality called Practical Guide to Software Quality Management. *Horch is a senior member of the IEEE and of the ASQC and a member of the Quality Assurance Institute, as well as other professional organizations.*

facts & stats

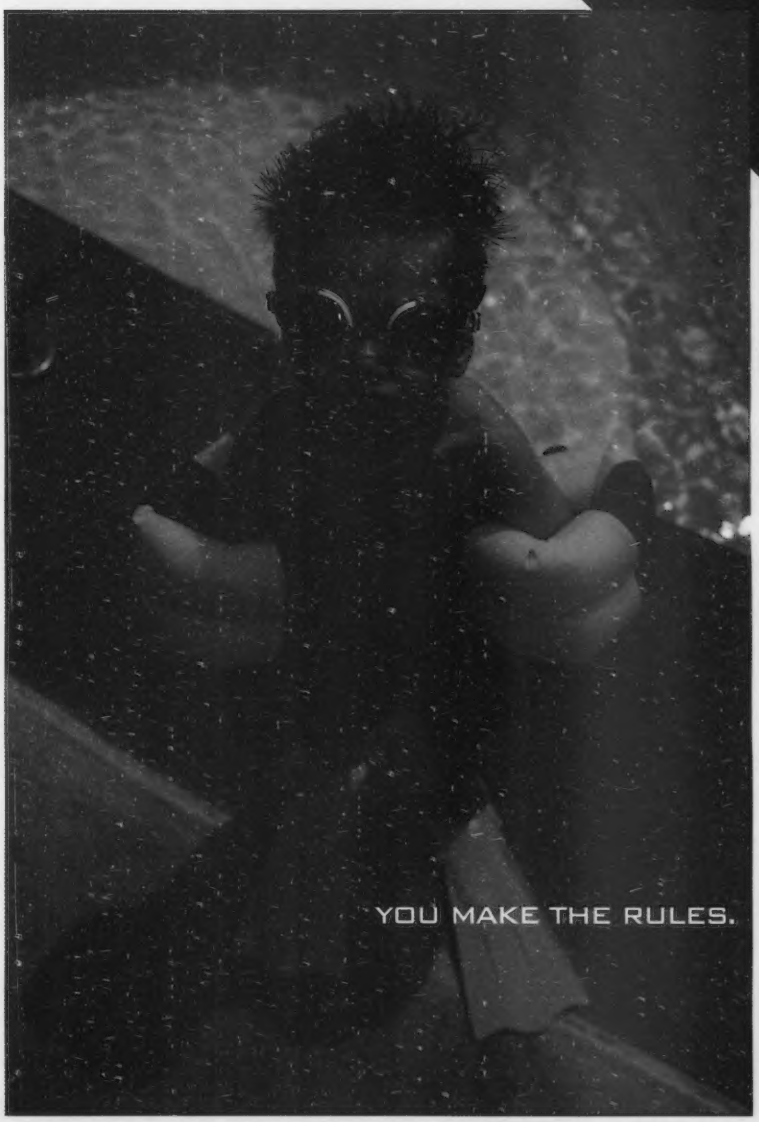
Question: What software quality issues has your company faced?
Repairing defective software after shipment: 54%
Cost overruns: 47%
Downtime caused by unreliable applications: 33%
Weakened competitive edge/missed market opportunity: 25%
The typical respondent faced at least two of these issues.
Source: The CenterLine survey of 240 Fortune 1,000 companies in North America and Europe.

MCI Communications Corp. last year overcharged customers $45 million because of a software glitch. The company says it can't pinpoint exactly who was overcharged.

More than 90% of developers have missed ship dates within the past year. Missing deadlines is a routine occurrence for 67%. Ninety-one percent have been forced to remove key functionality late in the development cycle to meet deadlines.

Of sites that have a repeatable quality process, 81% seldom or never miss any deadlines.
Source: The CenterLine survey.

"WAIT AN HOUR
AFTER EATING BEFORE
YOU GO IN THE WATER."



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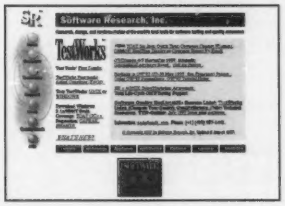
Resources Web sites and conferences more

Getting quality help on software issues

By Amy Malloy

If you crave more information about how to improve the quality of your software, you aren't alone. Here are some World Wide Web sites, conferences, seminars, books and articles to get you up to speed or keep you current on software quality.

Software Research Institute, Inc.'s Software Quality Hotlist
www.testworks.com/Institute/HotList
This comprehensive Web site provides links to nearly all the other sites mentioned in this resource guide. The site doesn't contain any original content, but that isn't its purpose. It supplies links to sites on many aspects of software quality in the U.S. and elsewhere.

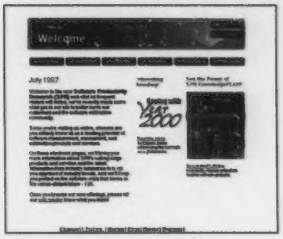


Software Quality Institute
www.utexas.edu/coe/sqi
A partnership between the University of Texas at Austin and various software and information systems organizations in Texas, the Software Quality Institute (SQI) is a nonprofit organization focused on educating software producers and users. The site includes an online newsletter with archives dating to early last year, a description of local quality seminars and links to software employment Web sites and SQI-sponsored organizations.

Technical Council on Software Engineering
www.tcse.org
Though sparse on software quality-specific information, The IEEE Computer Society's Technical Council on Software Engineering site provides pointers to the council's activities and contacts. Information on related conferences and a membership enrollment form top the site's offerings.

Ed Yourdon's Web Site
www.yourdon.com/index.htm
The author, a year 2000 expert, technical guru and consultant, posts information about his books, articles and seminars at this site. You'll also find his electronic-mail address and fax and telephone numbers. This is a good one-stop shop for all of Yourdon's insight into software quality, if you don't mind maneuvering around frames.

Software Quality Group
www.nist.gov/itl/div897/sqg/sqg.htm
Hosted by the National Institute of Standards and Technology (NIST), this site details the group's activities, which include developing tools and methods to improve software quality. The site contains a list of relevant publications on the topic, but the most recent mention dates to last year. The site is easy to navigate and provides links to the NIST home page and other divisions.



Software Productivity Research
www.spr.com
This consultancy derives much of its reputation from Capers Jones, company founder and software quality expert. The site lays out the company's consulting and training services. Trade show information is also available here.

American Society for Quality
www.asqc.org
Not geared solely toward software quality, the American Society for Quality explores the issue of product quality on a large scale. The society describes itself as having "products, services, and — most of all — information to help people in all walks of life grapple with perplexing issues like total quality management, benchmarking, productivity and more." This clearly laid-out site contains quality definitions, conference and educational information, standards and certifications.

books

Applied Software Measurement: Assuring Productivity and Quality
By Capers Jones
McGraw Hill Text
ISBN: 0070328269
List price: $59

An ISO 9000 Approach to Building Quality Software
By Osten Oskarsson and Robert L. Glass
Prentice Hall PTR, Upper Saddle River, N.J.
ISBN: 0132289253
List price: $47

Software Assessment: Reliability, Safety, Testability
By Michael A. Friedman and Jeffrey M. Voas
John Wiley & Sons, New York
ISBN: 047101009X
List price: $64.95

Testing Computer Software
By Cem Kaner, Jack Falk and Hung Quoc Nguyen
International Thomson Computer Press, Boston
ISBN: 1850328471
List price: $32.95

Rapid Development: Taming Wild Software Schedules
By Steve McConnell
Microsoft Press, Redmond, Wash.
ISBN: 1556159005
List price: $35

The Mythical Man-Month: Essays on Software Engineering
By Frederick P. Brooks Jr.
Addison-Wesley Publishing Co. Reading, Mass.
ISBN: 0201835959
List price: $25.77

conferences

other sites

Quality Assurance Institute
www.qaiusa.com

Society for Software Quality
www.ssq.org

Software Quality Engineering
www.sqe.com

Quality World
www.qualityworld.com

The Software Productivity Consortium
www.software.org

The National Software Council
www.nscusa.org

ISO Easy
www.exit109.com/~leebee/

Software Engineering Institute
www.sei.cmu.edu

Software Quality Week
In Brussels Nov. 4-7; in San Francisco next May. Contact: Margaret Kinney, marketing manager, the Software Research Institute, San Francisco, Calif. (415) 957-1441; E-mail: qw@soft.com; Web address: *www.soft.com.*

EuroStar 97
Fifth European Conference on Software Testing Analysis and Review, Edinburgh, Nov. 24-28.
Phone: (44) 178 44 64 106

Eighth International Conference on Applications of Software Measurement
Atlanta, Oct. 27-30. Contact: Software Quality Engineering, Jacksonville, Fla. (904) 268-8639; Web address: *www.sqe.com*

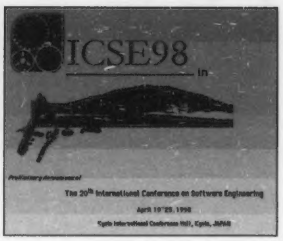
1998 International Information Technology Quality Conference
Clarion Hotel, Orlando, Fla., April 13-17. Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111

The Eighth International Symposium on Software Reliability Engineering
The Sheraton Old Town Inn, Albuquerque, N.M., Nov. 2-5. Contact: The IEEE Computer Society's Technical Council on Software Engineering, Washington, D.C. Web address: *http://admin.ONE2ONE.com/issre97*

7th International Conference on Software Quality
Embassy Suites Hotel, Montgomery, Ala., Oct. 6-8. Contact: American Society for Quality, Milwaukee, Wis. (800) 248-1946. Web address: *www-biz.aum.cdu/~tgriffin/7icsq*

Practical Software Quality Techniques
Minneapolis, Oct. 7-8. Contact: Software Productivity Research, Burlington, Mass. Web address: *www.spr.com/html/trade_shows.htm*

International Conference on Software Maintenance '97
Bari, Italy, Sept. 29-Oct. 3. Web address: *www.cis.ohio-state.edu/~harrold/icsm97/*



20th International Conference on Software Engineering (ICSE)
Kyoto International Conference Hall, Kyoto, Japan, April 19-25. Contact: ICSE. Web address: *http://icse98.aist-nara.ac.jp*

52nd Annual Quality Congress
"The Quality Revolution: Adapting Methods and Processes for the Journey to the Future," Philadelphia Convention Center, Philadelphia, May 4-6. Contact: American Society for Quality, Milwaukee, Wis. Web address: *www.asq.org/products/conferences/aqc/aqcgen.html*

related articles

seminars

Software Quality Engineering
(904) 268-8639
www.sqe.com

Quality Assurance Institute
(407) 363-1111
www.qaiusa.com

Software Productivity Research
(617) 273-0140
www.spr.com/index.htm

"Dancing with devils: Or facing the music on software quality," by Tom Barrett
Electronic Design, three-part article, June 23, 1997, page 117
The relationship between the product developer and the tool manufacturer is examined, and the economics of testing is reviewed. The four phases of testing — specification, development, testing and operation — are explained, and the static and dynamic categories of testing are defined.

"Using peer code reviews to increase software quality," by Timothy Blayne
Enterprise Systems Journal, June 1997, page 54
Blayne suggests doing a periodic peer code review at least once per month, in addition to testing. He details the most effective way to approach a peer code review.

"Software quality: Now there are no excuses," by Bob Deinhammer
Electronic Engineering Times, Jan. 13, 1997, page 45

Software QA Magazine — A bimonthly publication by and for software quality assurance professionals
Steve Whitchurch, editor
Ridgetop Publishing Ltd.
Molalla, Ore.

For previously published *Computerworld* articles on software quality, visit our Web site at *www.computerworld.com.*

Malloy is Computerworld*'s associate editor, Buyer's Guide.*

books

Software Quality: Analysis and Guidelines for Success
By Capers Jones
International Thomson Computer Press, Boston
ISBN: 1850328676
List price: $39.95

Software Quality: Producing Practical, Consistent Software
By Garry S. Marliss and Mordechai Ben-Menachem
International Thomson Computer Press, Boston
ISBN: 1850323267
List price: $39.99

Quality Software Management: Anticipating Change (Volume 4)
By Gerald M. Weinberg
Dorset House Publishing Co., New York
ISBN: 0932633323
List price: $44.95

The Complete Guide to Software Testing
Bill Hetzel
Q E D Publishing Co., Norwalk, Conn.
ISBN: 0471565679
List price: $54.50

Inroads to Software Quality — "How to" Guide and Toolkit
By Alka Jarvis and Vern Crandall
Prentice Hall PTR, Upper Saddle River, N.J.
ISBN: 0132384035
List price: $45

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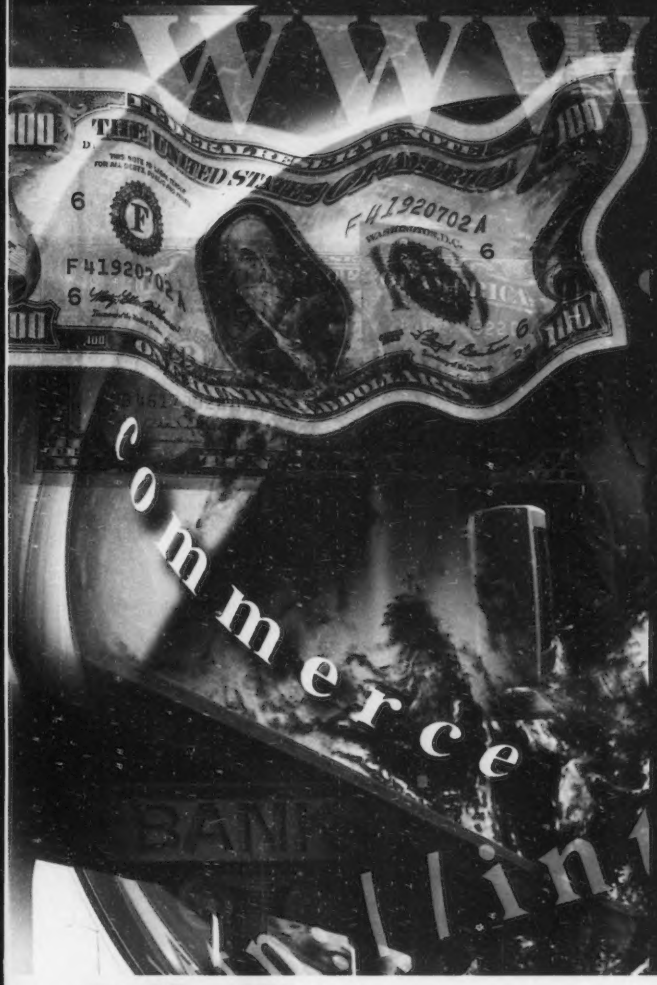

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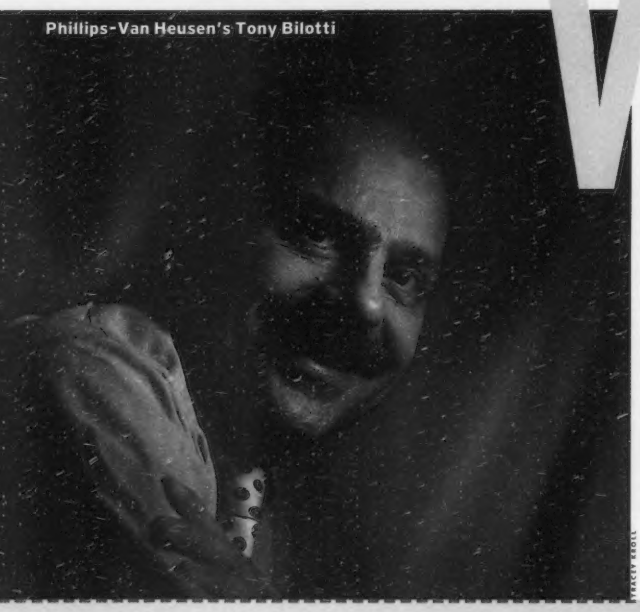
Career opportunities

BUG breaking in

Charged with cleaning up the sins and shortcomings of software developers, quality assurance professionals suddenly are a very hot property. In the process, they may also finally get some respect

By Natalie Engler



Phillips-Van Heusen's Tony Bilotti

When developer Tony Bilotti was promoted to software quality assurance specialist at Continental Insurance Co., he thought it was a punishment.

"I didn't understand what quality assurance was," Bilotti says now, after 10 years in the field. Among developers, "the association with [quality assurance specialists] is that they don't produce anything. Because they don't."

Welcome to the most underappreciated and misunderstood career in information technology: software quality. It's also arguably one of the most important.

Put simply, software quality assurance and testing professionals make software better. Quality assurance people prevent defects, and testers discover bugs and oversights before they reach the customer. (For

There are several routes into software quality. Some people start at a large technology-intensive company such as Lucent Technologies, Inc., Motorola or Microsoft Corp., all of which have well-developed curricula. Others join testing teams within smaller software concerns. The following are stories of three people who fell into — and in love with — the field.

JACKIE BURLESON
Test manager in treasury product support
Global Finance Division, NationsBank

When Jackie Burleson received her MBA from the University of North Carolina at Greensboro in 1988, she went straight into marketing. A logical choice, perhaps, but she didn't find the adrenaline rush she had hoped for.

Unsure where to turn, she scanned a list in a magazine of the top 20 careers for women, but "nothing grabbed me," she says. Then she turned the page and discovered a blurb about software development. "It sounded interesting," she says.

But without a technical background, Burleson wasn't sure where she'd fit in. She started applying for jobs anyway and found a few companies that were creating test centers. One of them was Network Computing Corp., a company that developed software for county and small city governments. It gave Burleson the break she needed.

Starting out in a small company had its advantages. Burleson says she "got to see the system from the beginning to end." She would test each product, learn the ins and outs of it, then go to customer sites and provide training.

Later, she and two co-workers left to start a test center at NationsBank, which was implementing a large World Wide

Killers

more detailed descriptions, see story, page 92.)

Today, as director of quality assurance in the information systems group at Phillips-Van Heusen Corp. in New York, Bilotti says he knows he's anything but deadweight. He redefined the $1.5 billion apparel company's processes for software development, maintenance and change management, and implemented testing standards. Now he leads the team charged with solving the year 2000 code conversion problem.

Despite the importance of software quality professionals such as Bilotti, they're often treated as pariahs, says Howard Rubin, chairman of the department of computer science at Hunter College in New York and president of Howard Rubin Associates, Inc. in Pound Ridge, N.Y.

"Companies don't appreciate and leverage the value of these folks," Rubin says. A whopping 86% of the quality assurance professionals who responded to a recent Quality Assurance Institute (QAI) survey agreed that their function "is not clearly understood throughout the organization."

Software quality professionals make up only 3% to 5% of the software jobs in the U.S. (vs. 10% to 12% in Europe and Asia). Managers send them to conferences to get them out of their hair, and programmers regard them as the enemy. They routinely find fault with developers' work. Steve Devinney, managing director of the QAI, in Orlando, Fla., says it's easy to take that as an attack on competency.

As Jackie Burleson puts it, "You are basically telling someone their baby is ugly. Sometimes that doesn't go over well." Burleson is a test manager at NationsBank Corp., a Charlotte, N.C.-based banking company with $240 billion in assets.

Still, their status as the "professional homeless" notwithstanding, "opportunities for software quality professionals will be emerging in this country" soon, Rubin says. Thanks to the spread of standards, the U.S. economy's software dependence and the year 2000 conversion problem, more and more companies are focusing on quality.

"All the pressures are there," Rubin says. And it seems that, finally, the software quality profession may be recognized as a profession.

A SURGE IN DEMAND

One organization that doesn't see things that way is the Bureau of Labor Statistics, which doesn't include software quality jobs in its occupational employment statistics. People's tendency to lump together maintenance and enhancement makes it even tougher to track the rise of software quality professionals, says Capers Jones, founder and chairman of Software Productivity Research, Inc. and author of nearly a dozen books on software development.

But substantial anecdotal evidence indicates that demand is surging. Software quality veterans say they receive several calls each week from headhunters and firms looking for software quality people. Some classified ads carry more and more quality-related listings.

And at a recent QAI conference, the bulletin board was covered with job postings, Burleson says. There's such scarcity that when an attendee mentioned she might be looking for a job, "three or four people handed her their business cards before she could finish the sentence," Burleson says.

Asked if their organization had at least one quality assurance group, 81% of the conference participants said it did, vs. only 63% the previous year.

The job requirements also are multiplying. Today, many testing specialists are trained in defect estimation, measurement, inspection and testing methods. More than half of the respondents to the QAI survey said they held one or more professional certifications, almost a 10% increase over last year's results.

Quality assurance professionals need to know standards such as ISO9000-3; the Software Engineering Institute's Capability Maturity Model for Software (a de facto standard for assessing and improving software processes); processes established by companies such as Motorola, Inc., AT&T Corp. and Bell Laboratories; and military standards of software development, says Alka Jarvis, manager of quality systems at Cisco Systems, Inc. in San Jose, Calif. Software quality has evolved so much, she says, it now includes continuous improvement and the plan-do-check-act cycle developed by W. Edwards Deming, the father of total quality management.

For every dollar that U.S. corporations spend on IT, 30 cents goes down the drain because of quality issues (rework, rewrite and systems that don't work), Rubin says. As a result, "quality has become the low-hanging fruit for IT investments."

The challenge for employers and newcomers is that few U.S. universities include software quality assurance or testing as part of their computer science programs. Only two organizations offer certification: the QAI and the American Society for Quality (see Resources, page 92). People looking for testing specialists are struggling.

"There's a huge gap," Burleson says. "No one really has that background."

In response, companies such as NationsBank are beefing up college recruiting efforts and creating in-house classes. Some are even offering better compensation. According to Jarvis, quality analysts with seven years of experience average between $60,000 and $120,000 per year.

Although entering the field may be easier, and the rewards may be greater, one sad fact remains: "The biggest challenge for these folks," Rubin says, "is to get their companies to invest the time to get the job done right." □

Engler is a freelance writer in Cambridge, Mass.

Web and computer telephony project for customers. Today, she is test manager at the bank's Global Finance Division.

How does Burleson spend her days? Mostly in meetings, she says. The project is in its initial phase, so her team is reviewing functional requirements and detail design documents to begin the test planning process. Her team members also do a lot of virtual team building, because NationsBank has project teams all over the country.

"A good part of what we're doing is trying to build rapport among the teams and figure out how the responsibilities lay out," she says. Burleson says the part she likes best about her job is getting "an overall picture of the project." And she says it's gratifying to see her team's role evolve from quality control, such as catching problems, to true quality assurance, which involves preventing problems.

ALKA JARVIS
Manager of quality systems
Cisco Systems

Jarvis got into software quality in the late 1960s, when she was selling software at a small company. After telling the company's president repeatedly about glitches in her demonstrations, he finally turned to her and said, "Why don't you do something about it? You are the only one complaining."

"I looked at him like, 'What am I supposed to do?'" she says. Then she went to the Golden Gate University library and looked up the word "test." "I started reading, and I thought it was amazing," she says.

From that moment on, Jarvis made quality her mission. She joined the Bay Area Quality Assurance Association (BAQAA). After attending meetings and listening to speakers, she had learned enough to create a software quality assurance manual and recruit people to help her write a test plan for her company.

From there, she went on to establish quality assurance departments at Bank of America, Apple Computer, Inc., and Charles Schwab & Co., and she consulted at several Fortune 500 companies.

Jarvis also was elected president of the BAQAA. Hoping to help others enter the

Continues, page 92

Software quality: it's up to developers, too

For some developers, quality assurance and testing offer a great career path. But it's a mistake to think they're the only ones in the game.

"Quality should be built in by developers and not treated as an afterthought to be fixed up by the [quality assurance] folks," says Howard Rubin, chairman of the department of computer science at Hunter College and president of Howard Rubin Associates. "What happens is people assume bugs are a fact of life and build in processes [such as unit tests] to get rid of them. It would be nice not to put the bugs in."

Unfortunately, the world doesn't work that way. "I have yet to see a company where the relationship between developers and testers is halfway adequate," says Alka Jarvis, manager of quality systems at Cisco. "People are always pointing fingers."

But there are signs that change is afoot. A trend among some larger companies is to loan a software quality assurance person to each product line, Jarvis says. The quality assurance person remains on the project from start to finish and works closely with the project manager. "This creates harmony between the quality assurance person and the team, because the person becomes part of the team," she says.

> "I have yet to see a company where the relationship between developers and testers is halfway adequate."
> – Alka Jarvis, Cisco

Also, some leading-edge firms are involving developers in formal inspections, says Capers Jones, founder and chairman of Software Productivity Research. Unlike unit tests, which remove about 30% of the bugs after coding, inspections eliminate 60% to 65% of errors *before* testing. So far, Jones estimates, about 15% to 20% of companies perform inspections.

Phillips-Van Heusen is one. The shirt maker is working on making quality part of every developer's job.

"We are trying to get them to understand why it's important to do things a certain way and for them to institute their own quality practices," says Tony Bilotti, director of quality assurance. That effort includes involving developers in requirements collection, where half of most software errors are introduced. Many can be eliminated by using a formal collection process.

Another company addressing the problem is NationsBank, which recently developed a testing class for developers. "We're trying to stress that if you don't know up front what you're trying to test for, how do you know you've programmed correctly?" says Jackie Burleson, test manager. The bottom line is to show developers that "we're all in this together," she says. — Natalie Engler

WHAT DOES A SOFTWARE QUALITY PROFESSIONAL DO, ANYWAY?

Common questions and answers collected from software quality experts:

SOFTWARE TESTING

Q. What are the job titles?
A. Testing specialist, director of software testing, test manager, occasionally quality assurance specialist and more recently, year 2000 specialist and International Standards Organization (ISO) inspector.

Q. Who are they and what do they do?
A. Testers are product-oriented; they are concerned with eliminating defects. They focus on business requirements and the ability to understand those requirements, and they develop test scenarios that ensure that those requirements are met. In some companies, testers are responsible for defining a process to manage defects. Their tasks include test-plan generation, doing inspections and walk-throughs, picking tools, designing processes, collecting metrics and doing benchmark calibration.

Q. What skills do they need?
A. Training in defect estimation, measurement, inspections and testing methods. They also need good planning abilities, good communication skills, the ability to analyze results and compare them with expectations, and loads of tact.

Q. Where do they come from?
A. User, business analyst or IS ranks.

Q. What's the career outlook?
A. Thanks to the year 2000 conversion problem, the future looks bright for testing professionals, says Steve Devinney, managing director of the Quality Assurance Institute.

QUALITY ASSURANCE

Q. What are the job titles?
A. Quality assurance specialist, vice president of software quality assurance and director of software quality assurance.

Q. Who are they and what do they do?
A. Quality assurance jobs are process-oriented. Quality assurance professionals focus on preventing defects. They develop the procedures a company follows to develop and maintain software, predict the number of bugs and predict the effects of development methods on quality. They also explain quality's bottom-line impact to managers.

Q. What skills do they have?
A. Depending on the level, requirements may include knowledge of software processes, measurement, inspections, methods and standards such as SPICE (an international collaborative effort to develop a standard in the area of software process assessment), bootstrap, European Strategic Programme of Research into Information Technology (ESPRIT), ISO9000-3, the Capability Maturity Module, military standards, and software process standards established by companies such as Motorola, AT&T and Bell Labs.

Professionals also need good communications and business skills and tact.

Q. Where do they come from?
A. The IS ranks. Often they start as developers.

Q. What's the career outlook?
A. The future looks promising, says Howard Rubin, chairman of the department of computer science at Hunter College, because year 2000 projects need staffers, and businesspeople who are growing accustomed to the quality of packaged software expect more from in-house applications.

CAREER RESOURCES

American Society for Quality
(Offers exam for certified software quality engineer)
Milwaukee, Wis.
(800) 248-1946
www.asqc.org

Quality Assurance Institute
(Offers software quality analyst and test engineer certification)
Orlando, Fla.
(407) 363-1111

SR/Institute's Software Quality HotList: Links to organizations and institutions that support the software quality area.
www.testworks.com/Institute/HotList/

Software QA magazine
Ridgetop Publishing Ltd.
Molalla, Ore.
$60 for six issues per year
editor@ridgetop.com

Information on standards such as the **Software Engineering Institute's Capability Maturity Model, ESPRIT** and **SPICE**
http://ftp.sei.cmu.edu

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field, she began to teach seminars and classes and even sold the University of California at Berkeley extension school on the idea of an applied total quality management certificate program. The school appointed her to its total quality advisory board and made her an instructor.

Jarvis helped develop a certificate program in continuous improvement and quality management at the extension school of the University of California at Santa Cruz. She serves as an adjunct professor in the MBA program for computer science at Santa Clara University and is an adviser for launching a software quality assurance professional certificate program at De Anza College in Cupertino, Calif.

Jarvis also became a certification board member for the QAI and an advisory board member for the certificate program in continuous improvement and quality management.

Not one to take the dearth of resources passively, Jarvis also co-authored two books on software quality.

ANDREA BOLAND
Quality assurance specialist
Softworks, Inc.

When Boland received her bachelor's degree in MIS in 1986, no one talked about testing as a career option. She didn't enter the field until after she had been a developer at the Alexandria, Va.-based commercial software company for more than eight years. The firm formed an independent testing group and asked her to join.

Boland says she likes testing because she enjoys "things that are definite and creative."

She says there's no such thing as perfect software, but "if we do a good job with quality assurance, it improves the whole organization." Her long-term plan

is to move from a testing role to a quality assurance role so she doesn't become pigeonholed.

Boland says she's learning "a lot more" as a tester than as a developer working on a single product. "Now, the sky's the limit," she says.

Best of all, "It's a wonderful feeling being able to do work that I like and that I'm naturally good at. It's like turning a personality trait into a job," Boland says.

— Natalie Engler

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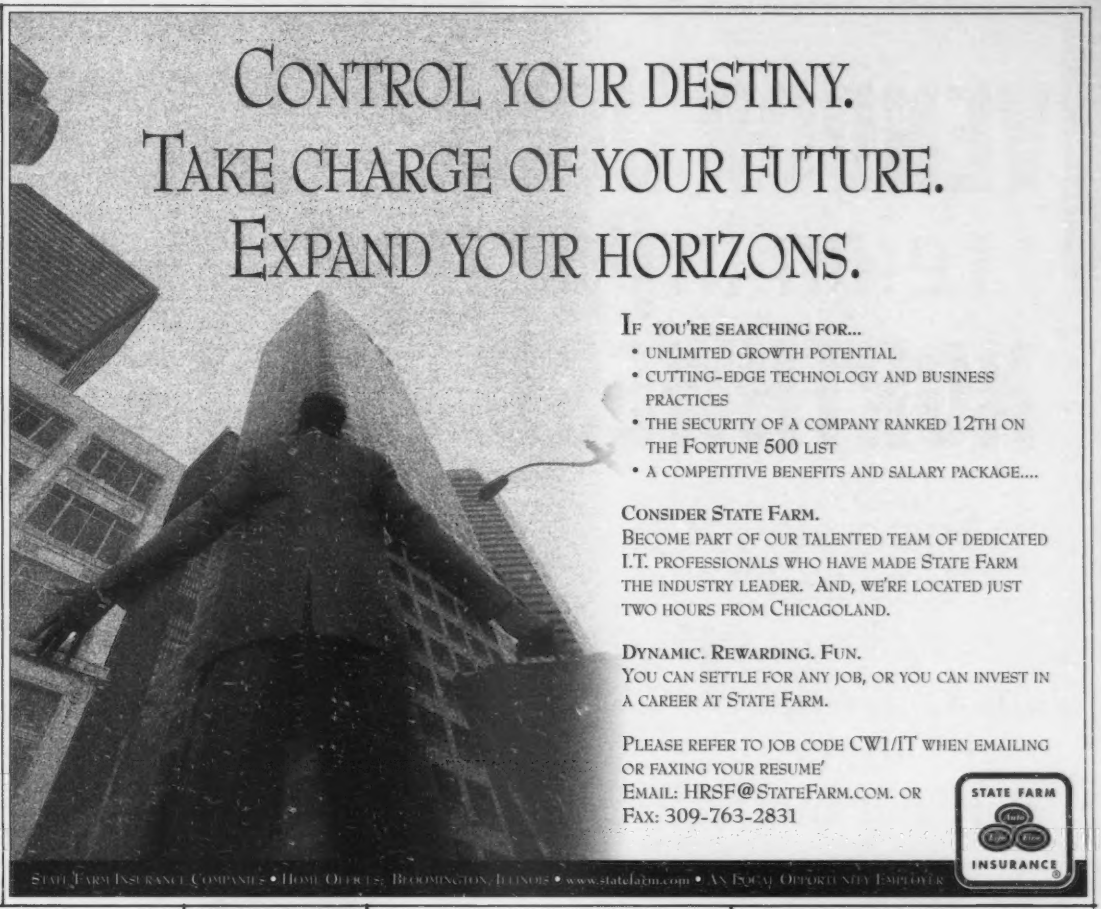

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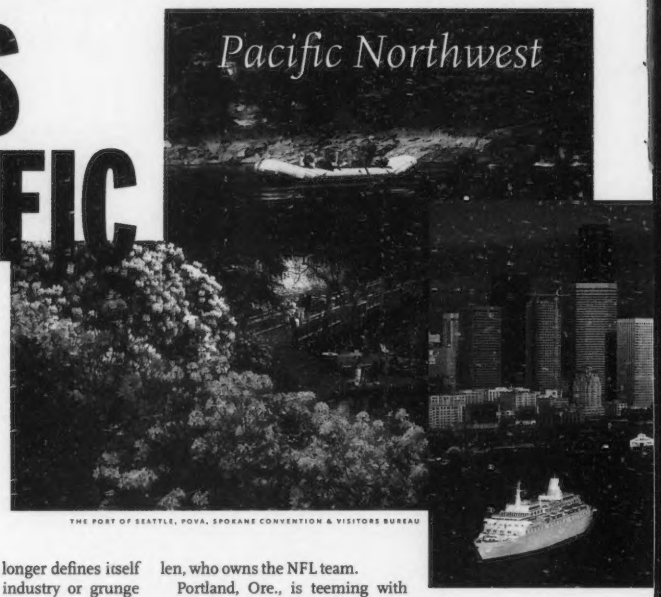

THE PORT OF SEATTLE, POVA, SPOKANE CONVENTION & VISITORS BUREAU

Microsoft, Intel and start-ups spawn hiring in Seattle, Portland and Spokane

By Amy Malloy

THE PACIFIC NORTHWEST no longer defines itself by its rainy weather, logging industry or grunge scene. Although it remains a hip place for the young crowd and still relies on its natural resources, the area is taking on a high-tech image as it heads toward the 21st century.

Bustling would best sum up the area. There's a youth and energy to this part of the country. Walking through the streets of Seattle, one sees diverse lifestyles, rich culture and booming business — all in spite of the rain.

The software industry here is on fire. Inspired by Microsoft Corp., start-ups have moved to the area in droves. Everything in this region seems to be in Microsoft's shadow, says Wayne Deckman, network administrator at Fred Hutchinson Cancer Research Center. Even the Seattle Seahawks are tied to Microsoft, Deckman says, referring to Microsoft co-founder Paul Allen, who owns the NFL team.

Portland, Ore., is teeming with semiconductor plants, which means moving to this part of the country isn't risky for information systems professionals. Employers are looking for anything and everything when it comes to technology professionals and skills, says Angel Cortez, a senior systems analyst at Nordstrom, Inc. in Seattle.

If all this talk of hustle and bustle has your head spinning, images of Spokane, Wash., might slow things down for you. Conservative, less hectic, no traffic, rural atmosphere, quality employers — that's how Lonnie Crone, vice president of IS at Medical Services Corp. in Spokane, describes the city.

In all three cities, there should be a job to match your skills. And if a job alone isn't incentive enough to move, native Pacific Northwesterners suggest coming for the mountains, the water, the culture, the food, the beautiful surroundings and the coffee.

Seattle: MARKET SUMMARY

You name the skill; Seattle needs it. IS professionals with skills ranging from Java to Cobol can find homes at more companies than just Microsoft or The Boeing Co. All industries need talented IS help. Some of the top employers are Microsoft, Boeing, Weyerhauser Co., Price Costco, Nordstrom, Inc. and Safeco Corp.

Software engineers with C++ and Visual Basic knowledge, World Wide Web developers, and midlevel professionals skilled in Java, Oracle, SQL Server, Unix and Cobol are in demand.

There are more jobs than qualified people. Airborne Express has openings for application developers, client/server operating systems experts and database analysts, according to John Kirchgessner, director of IS recruiting.

On the mainframe side, the year 2000 push has created a high demand for Cobol programmers. But remove the year 2000 conversion problem from the picture, and client/server skills drive the market, says Sylvia Soliz, network manager of the department of administration for the city of Seattle.

Portland: MARKET SUMMARY

Portland's catchy nickname, the Silicon Forest, says it all. According to the Portland Development Commission, the number of IS jobs in the vendor community increased from 33,000 in 1988 to 57,400. Major private-sector employers include Intel Corp., Fred Meyer, Inc., Providence Health System and Kaiser Permanente Health Plan, Inc.

Although Portland is a large semiconductor and software industry market, Portland employers in all industries need IS professionals skilled in client/server areas. Windows programming and software engineering demands outweigh the demand for mainframe skills.

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Where do I look, what will I see and what will it pay? For more information on Seattle, Spokane and Portland, visit our Online IT Careers site at: www.computerworld.com/careers.

Spokane: MARKET SUMMARY

The IS market fluctuates, but finding a job generally isn't a problem. Spokane Intercollegiate Research and Technology Institute, an alliance of business, industry, education and government, works to give the region a competitive edge in various information-based and technological industries. The city is home to many health care organizations and is the largest health care area between Seattle and Minneapolis. Top employers in the area include Kaiser Aluminum & Chemical Corp., Key Tronic Corp., Guardian Life Insurance Co. and Hewlett-Packard Co.

Jobs aren't as readily available as in Seattle or Portland, but they exist. There's been a general move toward client/server in recent years, which Bill Donner, supervisor of planning and technology at Washington Water Power Co., attributes to the fact that a lot of mainframe shops have left town. There's a need for professionals with desktop, client/server, Unix and Windows NT skills. □

Malloy is Computerworld's associate editor, Buyer's Guide.

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Sr. NT Analyst

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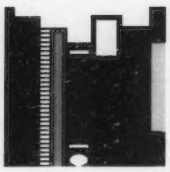

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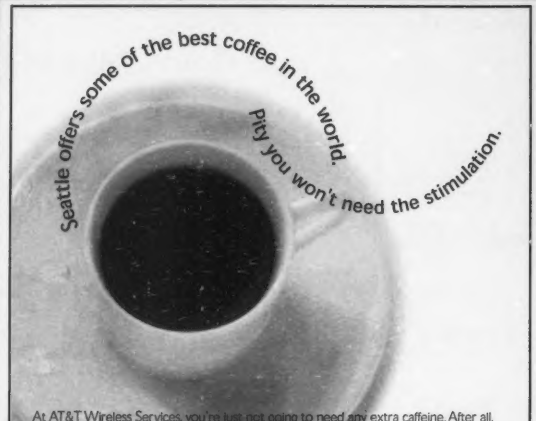

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Senior Software Engineer: Analyzes software requirements to determine feasibility of design within time and cost constraints. Consults with system user and management personnel to define systems objectives, architecture, design and interfaces. Constructs systems models and prototypes for application of Rapid Application Design and Object Oriented Methodologies. Formulates and designs software systems, using scientific analysis and mathematical models to predict and measure outcome and consequences of design for in-house and consulting industrial applications. Develops and directs software system testing procedures programming, and documentation using knowledge of SAP/R8, ABAP/5, UNIX, AIX, RS/6000/C++, Visual C++, C, Windows NT & NT Server, Informix, SQL, Oracle, Lan/Wan, Visual Basic, Powerbuilder, IEF, Summit D, Composer, AS400, MVS, Cobol, IMS, and/or CICS. Candidates must possess an M.S. degree in Computer Sciences, MIS, or Engineering, and have 2 years experience in a related field that has extensively used any three of the above systems. $60,000 per year. Four positions available. Send resumes to Mrs. J. Gaston, Division of Employment Security, P.O. Box 339, Florissant, MO 63032. Refer to Job Order # - 505384.

Quality Manager

Solomon Software, the leading developer of Windows, Client/Server, and SQL-based accounting software for middle market businesses, has a rewarding opportunity for a Quality Manager at our Findlay, OH headquarters.

This newly created position will manage the testing of technical deliverable systems (quality, performance expectations, defect control, documentation, etc.). A degree in MIS, Computer Science or Business, and knowledge of software testing, software development, computerized accounting systems and project coordination, are required.

We provide an excellent compensation and benefit program (including profit sharing and stock option grant program). Please forward your resume in confidence to: **Solomon Software, Dept.-QMCW, P.O. Box 414, Findlay, OH 45839; Fax: (419) 424-3400; e-mail: mjoseph@solomon.com** We also invite you to visit our home page and career section at **http://www.solomon.com** Equal Opportunity Employer M/F/D/V

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Programmer Analyst needed for Int'l Freight Transportation Co. Plan/dsgn/dvlp/test & document comp prgm for Japanese clients; using SAS, S-Plus, SPSS, C, STATA, Excell. Bach-Comp Sci. Respond to: HR Dept, TAS Air Cargo, Inc., Attn: Ms. Meek 847-238-2505.

SYSTEMS ANALYST

F.E. Myers, a leading pump company has a need for a Systems Analyst for a growing multi-plant manufacturing company to do analysis, support, and programming for business applications. Current environment is IBM VM/VSE, COBOL, CICS, and VSAM, but would also like knowledge of AS/400 and client/server systems. Four year degree in Computer or Information Science desired. Related job experience is required. This challenging position will be involved with a major new system implementation as well as in support of existing systems. Includes medical, 401(k) and a Stock Purchase Plan. For immediate consideration send replies in confidence to:

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Federal Reserve Bank of Richmond

The Federal Reserve Bank in Richmond, Virginia currently has openings in our Business Application Services Department for:

Client Server Applications Analyst/Programmers
Mainframe Applications Analyst/Programmers
Development Center Technicians
Database Administrators

Individuals in these positions design, code, debug, and test complex programs, processes, and systems in a client/server and/or mainframe environment; develop applications using PowerBuilder, InfoMaker, Microsoft SQL/Server and/or DB2 or may code or modify existing mainframe programs using COBOL II.

The openings require a minimum of two years application development or support programming experience. Application development and implementation experience is preferred. Knowledge of microcomputers, Novell networks, PowerBuilder, GUI design, and SQL for client server positions; COBOL, TSO, relational database design, QMF, MicroFocus COBOL, DB2 and/or IMS for mainframe positions is desirable.

The Bank is a state-of-the-art shop using IBM 3090, client/server and WEB technology. Mainframe environment includes MVS/ESA, IMS DB/DC, DB2, and VSAM. The client/server environment includes WindowsNT and Microsoft SQL Server. Programming environment includes TSO, COBOL, PowerBuilder, MicroFocus COBOL, ENDEVOR, PVCS, and System Architect. We offer competitive salaries, excellent benefits, liberal education assistance, flexible working hours, and the opportunity for continued professional growth through challenging assignments. We are an equal opportunity employer. More information on the Federal Reserve Bank of Richmond can be found at WWW.RICH.FRB.ORG. Send resume and salary requirements by E-MAIL to Kirsten.B.Martin@rich.frb.org or mail to:

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Federal Reserve Bank of Richmond
P. O. Box 27622
Richmond, VA 23261

Software Engineer - To develop applications using ORACLE/SYBASE involving SQL, Stored Procadures, Open Client/Open Server. To provide system admin., tuning support SQL servers. To develop real-time application & networking sw for mission-critical distributed Client/Server applications using EZRPC, TCP/IP, Sockets, RPC, IPC, OOD in multiple flavors of UNIX (SunOS, Solaris, AIX, HP/UP), C, C++. To utilize knowl. of COBOL to interact w/ end users. To use UNIX internals in kernel configuration & system admin. To be responsible for Source Code configuration, release mgmt. using SCCS, makefiles. To guide the transition of core sw from Testing to high-quality Production systems using Perl, Sed, Awk, Shell scripts & other utilities. To apply knowl. of compilers, UNIX internals from multiple vendors to make portable sw. To build core architectural components using multiple flavors of UNIX, DOS & Windows, including GUI environments such as X/Motif, OpenLook, MS Windows, utilizing knowl. of OS internals & interprocess comm. To troubleshoot & identify systems problems by utilizing the following debugging tools: dbx, xdb, Object Center, CodeCenter, Purify, Glance, Quantify & Codeview. To develop, implement & maintain a highly visible financial portfolio auditing & accounting system using knowl. of multicurrency fund accounting & trading systems. To develop new Internet/Intranet applications using HTTP, Java, CGI scripts & research new sw & technologies. To develop a Document Template Format Report publishing system for high volume report generation using an Object-Oriented database like ObjectStore & integrate w/ existing reporting system. Must have MS or equiv. (BS + 5 yrs.' exp.) in CS or related field w/ 2 yrs.' software develop. exp. including: strong exp. in ORACLE/SYBASE RDBMS involving SQL, Stored procedures, embedded SQL, System Administration, Tuning, Open Client/Open Server; strong exp. in UNIX internals, EZRPC, TCP/IP, Sockets, RPC, NFS, DNS, IPC; strong exp. in real-time Distributed Client/Server Architecture; exp. in COBOL; multiplatform exp. on different flavors of UNIX, DOS w/ X/Motif, Open Look Windows; multivendor compiler exp.; in UNIX, C, C++; exp. in UNIX, Kernel Configurations; Systems Admin., Software Integration, Porting & Support, Shell Scripting, Sed, Perl, Awk; exp. in Source Code configuration, release mgmt using SCCS, RCS, makefiles; multiplatform exp. w/ programming & debugging tools (dbx, xdb, Glance). 40 hrs/wk; 9am-5pm; $62,577-$72,000/yr. Send 2 resumes to: Case #70141, P.O. Box 8968, Boston, MA 02114.

INFORMATION TECHNOLOGY DIRECTOR

The City of Gaithersburg located in the heart of Montgomery County Maryland approximately 12 miles northwest of Washington, D.C. is seeking qualified individual to plan, organize and direct the development, implementation and maintenance of the City's information technology and associated systems including network/client server environment.

Requires any combination of education and experience equivalent to a Master's degree in management information systems, computer science, data processing and 4-5 years of progressively responsible professional and managerial experience in developing, implementing and operating state-of-the-art information technology solutions. The successful candidate must have an excellent record of personal integrity.

The position is a full time, reporting to the Director of Finance and Administration, with a salary range of $49,964 to $78,944.

Send letters of interest and resume to Harold Belton, Director of Finance and Administration, 31 South Summit Avenue, Gaithersburg, Maryland 20877-2098 by September 12, 1997.

EOE-M/F/D/V

Project Manager/Lead Consultant, to perform complex and critical systems analysis tasks on SAP (Systems, Applications and Products in Data Processing) including project management, installation, implementation, business process design, integration management, trouble shooting, technical problem resolution, addressing software modifications to suit client requirements at various client locations; to maintain close liaison with SAP computer scientists and engineers to work out software modifications and enhancements. Need four (4) years or equivalent in relevant higher education in systems management; at least two (2) years and six (6) months of experience as SAP Consultant including knowledge and experience in SAP (Systems, Applications and Products in Data Processing) applications including knowledge of supply chain logistics; R/3 basis applications. The job site is in Stamford CT. Salary is $175,000.00 per year. If qualified send resume and cover letter documenting minimum qualifications to Job Order #3193206, Program Support - 3rd Floor, Connecticut Department of Labor, 200 Folly Brook Boulevard, Wethersfield, CT 06109.

Programmer Analyst required by specialized software development and consultancy company: Design and develop using object-oriented applications frameworks using CORBA standards such as ObjectBroker, Orbix on multiple platforms. Write portable code in C++ on VAX/VMS, Alpha/Open VMS, Windows 95 and Windows NT platforms. Conduct pilot studies to develop object oriented, real time software running in heterogeneous environment. Perform system integration, performance tuning and participate in all phases of software development including testing and support. Must have demonstrable experience in developing multiuser systems using databases such as VAX Rdb and MSSql Server, Programming 3-tier client server architectures using CORBA standards and porting of software from 32 bit to 64 bit architectures. Travel and relocation required to various unanticipated client sites throughout the United States, as assigned. Requirements: A Bachelor's degree in either Math or Engineering, or Computer Science and two years experience in the job offered or two years experience in the Related Occupation as Systems Engineer. Salary: $65,000/ Year 40 Hrs/Wk, 8:00 AM to 5:00 PM. Submit two copies of the resume to Case #70946, P.O. Box 8968, Boston, MA 02114.

Sr. Software Engineer. Plan, develop, test & document computer programs, applying knowledge of programming techniques & computer systems; evaluate user requests for new or modified programs to determine feasibility, cost & time required, compatibility with current system & computer compatabilities, consult with users to identify current operating procedures & clarify program objectives; formulate plan outlining steps required to develop program using structured analysis, & design; convert project specifications using flow charts. & diagrams into sequence of detailed instructions & logical steps for coding into language processable by computer; apply knowledge of computer programming techniques & computer language, analyze, design, develop & implement systems in Client/Server environment using GUI tools under multi-hardware & software platforms; design coding,testing & trouble-shooting using IBM PC or compatible, MS-Windows, Windows NT, SQL Server, ODBC, MS Visual C++ (MSVC++) & DOS. Requirements: Bach. degree in Electrcl Engrn. or Math or Computer Sc. or related field, 3+ yrs in job offered OR 3 yrs related occ. exp. as Software Eng., or Programmer, or Systems Analyst, or Consultant or related field. Related occ. exp must include at least 3 years exp. in the design,development, & implementation of applications using IBM PC or compatible, MS-Windows, Windows NT, SQL Server, ODBC, MS Visual C++ (MSVC++), & DOS. $64,000/yr., 8am-5pm, 40hrs/wk, M-F. Applicants should respond to: Case #70766, P.O. Box 8968, Boston, MA 02114. Applicants should submit two copies of his/her resume in response.

SENIOR SOFTWARE ENGINEER to provide on-site consultancy in data design architect, system analysis design, software application programming, testing and implementation using PowerBuilder in client/server environment, relational database Oracle, system and SQL Server; provide physical model for client database and evaluate database architecture; supervise a team of Junior Software Engineers and Programmers; provide computer user documentation for complete software life cycle. Require: M.S. in Computer Science/Engineering and three years experience in the job offered or as System Analyst. 50% travel to customer's locations required. Experience must include PowerBuilder applications. Salary: $67,000 per year, 8 am to 5 pm, M-F. Mail resume to: Tim Smith, Group Vice President, Computer Management Sciences, Inc., 2000 Windy Hill Road, Smyrna, GA 30080.

SOFTWARE ENGINEER
Design, Develop, Test and Implement applications for manufacturing industries using Object Oriented Methodologies. Must have demonstrated ability using UNIX and C; demonstrated ability in Object Oriented Design & Development using C++; and demonstrated ability working on Expert Systems. Must have M.S. in Computer Science or Related Field & 2 years experience in job offered or in software development. 40 hrs/wk, 8am-5pm, $68,000/yr. Send 2 resumes to Case #70983, PO Box 8968, Boston, MA 02114.

SOFTWARE ENGINEER: Analyzing and designing very large database (VLDB); Using Oracle Server to develop Distributed Database applications and handled Data replication using Oracle replication features; Developing procedures, functions and database triggers using advanced PL/SQL for server end processing; Using Oracle Designer 2000 Forms, Reports, PL/SQL for Client end processing. The job duties are: System study, Design, development and testing of the systems developed. Requires Bachelors in Engineering with two years experience in software development. 40 hours per week at $42,000/- per year. Please send resume to Case # 71248, PO Box # 8968, Boston, MA 02114.

SYSTEMS ANALYST to analyze, design, develop, test, implement and support GUI based computer systems and databases for client/server technologies using PowerBuilder with PFC, Oracle, Sybase, ERWIN, Informix, C, TCP/IP, Novell Netware and Business Objects Tools under UNIX, MS-DOS, and Windows 95 environments. Require: B.S. degree in Computer Science, or a closely related field, with two years of experience in the job offered or in the related occupation of Software Developer. Salary: $45,000 per year, 8:30 am to 5:30 pm, M-F. Apply by resume to: Dale Carringer, Branch Manager, CIBER Inc., 115 Perimeter Center Pl., Ste. 625, Atlanta, GA 30346; Attn. Job GN.

SOFTWARE ENGINEER to design, develop, test, implement, maintain and support financial application software systems using MS Visual C++, Visual Basic, MFC, OLE, Active X and COM on MS Windows 95/NT platforms; Write SQL stored procedures for data access against MS SQL Server and ORACLE. Require: M.S. degree in Computer/Electrical Engineering with one year of experience in the job offered or in the related occupation of Senior Programmer. Salary: $58,000/year; M-F 8 a.m. to 5 p.m. Send resume to: Wesley Daniels, P.M.S.C., 1 P.M.S.C. Center (Int. 1-77 & U.S. 21 N.), Blythewood SC 29016; Attn. Job NZ.

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Software Engineer: Design & formulate relational database system using Oracle, SQL, Sybase and Statistical & mathematical models. Interface programs using Unix, VAX/VMS, HP9000, DEC Stations 5000/240, IBM RT & IBM 6152 RISC Stations, Intel 8085/8086, VAX 6000, macintosh Quarda 950 & Centris 650. Design & develop software applications using C/C++, V.C++, PowerBuilder, Visual Basic, MS Access, Claris & Quark Express. 2 yrs exp + M.S. in Comp. Sc., $52,000/yr, 9AM to 6PM, 40 hrs/wk. Job location Gaithersburg, MD. Mail two copies of resume and copy of ad to: Department of Labor, Licensing & regulation, 1100 North Eutlaw Street, Room 212 Baltimore, MD 21201. CO# 9679222

Software Engineer. Design and develop two-tier client/server-based applications within mixed Windows and UNIX environments. Must have demonstrated ability designing and coding 16-bit and 32-bit Windows-based GUIs in VB and MSVC, using MFC and SDK tools, and custom controls such as VBX, OCX; demonstrated ability designing and developing dynamic, data-driven applications using languages such C, C++ using debuggers and source code control system such as PVCS; demonstrated ability in developing database driven client-server applications using ODBC with triggers and stored procedures using databases such as MS-Access, MS SQL Server and DB2; demonstrated ability in cross platform software development on UNIX platforms such as IBM and SunOS. $60,000/yr 40 hr/wk. 9a.m. - 5p.m. Must have 2 yrs exp (or 2 yrs exp as Programmer Analyst, Software Executive) and Engineering, Comp. Sci. rel. field/equiv. Send 2 resumes: Case #70840, P.O. Box 8968, Boston, MA 02114.

Sr. Software Engineer. Installing Sybase products, creating user groups, databases, granting permissions, backup/recovery, DBCC, performance tuning the server, database application, programming T-SQL, APT, DWB, DB Library & C programming in UNIX environment. Perform shell programming, tuning OS, performing cron jobs; preparing C programs to embed C in Sybase, programming embedded SQL; writing DFD (data flow diagrams, logical & physical implementation of database design, reverse engineering (writing DDL, data definition language `from existing database`). Requirements:Bach. degree in Electrcl. Engin., or Math, or Computer Sc. or related field and 1 yr., 6 mo. in job offered OR 1 yr, 6 mo. related exp. as Software Engineer, or Programmer, or Systems Analyst, or Consultant or related field. Related occ. exp. must include Sybase database administration for Sybase 10 & above using T-SQL, APT, DWB, DB Library & C programming in UNIX environment. $55,000/yr, 8am-5pm, M-F. Applicants should respond to: Case #70658, P.O. Box 8968, Boston, 02114. Applicants should submit two copies of his/her resume in response.

Programmer Analyst, Louisville, KY. Dsgn, prgm & implmnt SYBASE/T-SQL based Thermal Resistance & Property Analysis system & ORACLE/PL/SQL based prototype interface for Clinical Trials & reaction Analysis system. Define & implmnt SYBASE d/base trigger & ODBC subroutine to facilitate connectivity to the SYBASE database model. Incorp regression & correlation analysis logic in UNIX/C & SPSS modules for the property analysis subsystem. Provide prdct'n support for UNIX/C based Problem Reporting applic for remote user. Req MS-Engg or Comp Sci. Education or exp to incl Comp Prgmg, Database Systm, Process Calculation, Reaction Engg, Process Cntrl, Engg Analysis. $38,600/yr. Send resume to: Mary Rogers, Dept. of Employment Serv., 275 E. Main St. 2-W, Frankfort, KY 40621, JO#0349908.

Programmer/Analyst, Louisville, KY. Dvlp CAD/CAM based Product Design Modeling prototype. Utilize AUTOCAD to analyze prgm & implmnt specs for Component Design & prototyping applic. Dvlp CAD s/ware to capture & process binary image of product dsgn prototype. Utilize Finite or Discrete Element Analysis to dvlp Data & Image Compression algorithm to retrieve binary image. Eval & recommend change cntrl specs for GUI to incorp data & image conversion functions. Dvlp tech & system docum'n for modeling & data navigation function. Req MS-Engg or Comp Sci. Education or exp to incl Comp Prgmg, CAM, CAD, Finite or Discrete Element Analysis (proficient), Machine Dsgng, Engg Drawing, Engg Analysis, & Production Tech. $40K/yr. Send resume to: Mary Rogers, Dept. of Employment Serv., 275 E. Main St. 2-W, Frankfort, KY 40621, JO#0349907.

Senior Software Developer. Design, development and testing of a Network Middleware, which will be used to insulate Client/Server applications from underlying network technology and infrastructure. Ensure middleware software supports Remote Procedure Call (RPC) and Messaging facilities and provides interfaces to Common Object Request Broker Architecture (CORBA). Duties entail work with Multiplatform Middleware, TCP/IP Sockets and NamedPipes, CORBA, C, RPC and Messaging. Requires: Masters in Comp. Sci. or related field. One yr. exp in the job offered or one yr. exp. as a Software Engineer, Research Assistant, Teaching Assistant. The one yr. of exp. must involve Multiplatform Middleware Development, TCP/IP Sockets and NamedPipes, CORBA, RPC and Messaging, and C. 40 hr. wk. 8:30 am. - 5:00 pm. Mon.-Fri. $55,000/yr. Overtime N/A. Overtime $N/A. Interested applicants to apply to the nearest Job Service office, or submit a resume to: Job Service, 742-F East Chatham Street, Cary, NC 27511. All resumes must include the applicant's Social Security number, and Job Order #NC5770053 and DOT code 030.062-010.

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Software Engineers

Become part of a team designing and implementing object oriented software modules for the Microsoft Windows/NT platform, using the latest tools and design techniques. These modules control instruments, analyze and organize data, generate reports and provide other analytical services.

Minimum requirements are a BS in Computer Science or a degree in Engineering, Math, or Science with equivalent computer science experience. Experience with object oriented software design and development for large systems is also necessary. An MS/CS or equivalent advanced degree and experience is desired along with experience designing, developing, coding and testing large object oriented software systems, using Microsoft Visual C++, MFC, OLE, and COM/DCOM. Also helpful is a knowledge of network applications, chemistry, analytical instrumentation and instrument control by computer.

HP offers competitive compensation and an excellent benefits package that includes cash profit sharing. Interested applicants should send resume and cover letter to: **Hewlett-Packard Company, Employment Response Center RE# 5713, 3000 Hanover St., Palo Alto, CA 94304-1131, fax (415) 852-8138 or e-mail to hpresume@corp.hp.com** Hewlett-Packard Company is an equal opportunity employer dedicated to affirmative action and workforce diversity.

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DEVON CONSULTING

COMPUTER SYSTEMS OPERATIONS AND TELECOMMUNICATIONS EXECUTIVES

The Social Security Administration (SSA) in Baltimore Maryland is seeking to fill the executive position responsible for directing, managing and coordinating the planning, acquisition, implementation, security, operation and maintenance of SSA's computer systems operations. This senior executive also plans, implements and evaluates SSA's telecommunications technology and systems. SSA's Deputy Associate Commissioner for Telecommunications and Systems Operations (Systems Operations) is responsible for the day-to-day operations of the National data center which serves more than 51 million beneficiaries.

Candidates for this position must have extensive, proven and demonstrable experience and attributes in the following areas:

- Experience directing the day-to-day activities of a large data processing service-oriented organization.
- Broad experience in the security and capacity planning for a large data center operation.
- Broad experience directing, managing, designing and implementing operational changes in a large data operations center with multiple mainframes.
- Broad experience in acceptance and integration testing in a large data processing organization.
- Broad experience and current knowledge of procurements regulations/procurement process, particularly as it relates to major ITS procurements.
- Demonstrated strong leadership, communication, decision-making and interpersonal skills.

SALARY RANGE: $103,897 - $123,100 (includes locality pay)

HOW TO APPLY:
A copy of the complete announcement and filing instructions may be obtained either by calling the Office of Personnel Management's Federal Job Opportunity Board at (912) 757-3100 or contact Ms. Dickie Urbanski at SSA at (410) 965-4457. This information can also be obtained over the Internet at http://www.usejobs.opm.gov. Applications fully describing your experience and qualifications must be received at SSA by September 15, 1997.

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INFORMATION SECURITY OFFICER/ DATA SECURITY ADMINISTRATOR

Requires experience in the following:

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- **Disaster Recovery Testing**
- **Risk Analysis**
- **Computer Security Measures**

Must be knowledgeable of data processing hardware and software systems especially security software. Must be able to analyze and diagnose complex systems and have strong oral and written communications skills. Prefer experience in the following environments: UNIX, Novell, Windows, NT, AS/400, Sybase, Oracle, Internet.

Requires any combination of experience and education equivalent to a four year bachelors degree and five years technical experience. We offer a competitive salary and an excellent benefits package. Previous applicants need not re-apply. Interested persons must submit resume and cover letter stating salary requirements no later than August 29, 1997 to:

VIRGINIA HOUSING DEVELOPMENT AUTHORITY
Attn: Data Security Admin Recruiter (CW)
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• Oracle	• NT Upgrade	• TCP/IP	• Vis Basic	• HP Sys/Admin
• LAN/WAN	• FileNet	• Informix	• Testers	• Encina
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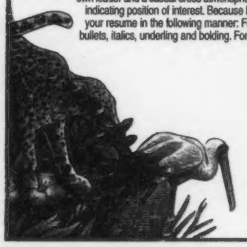

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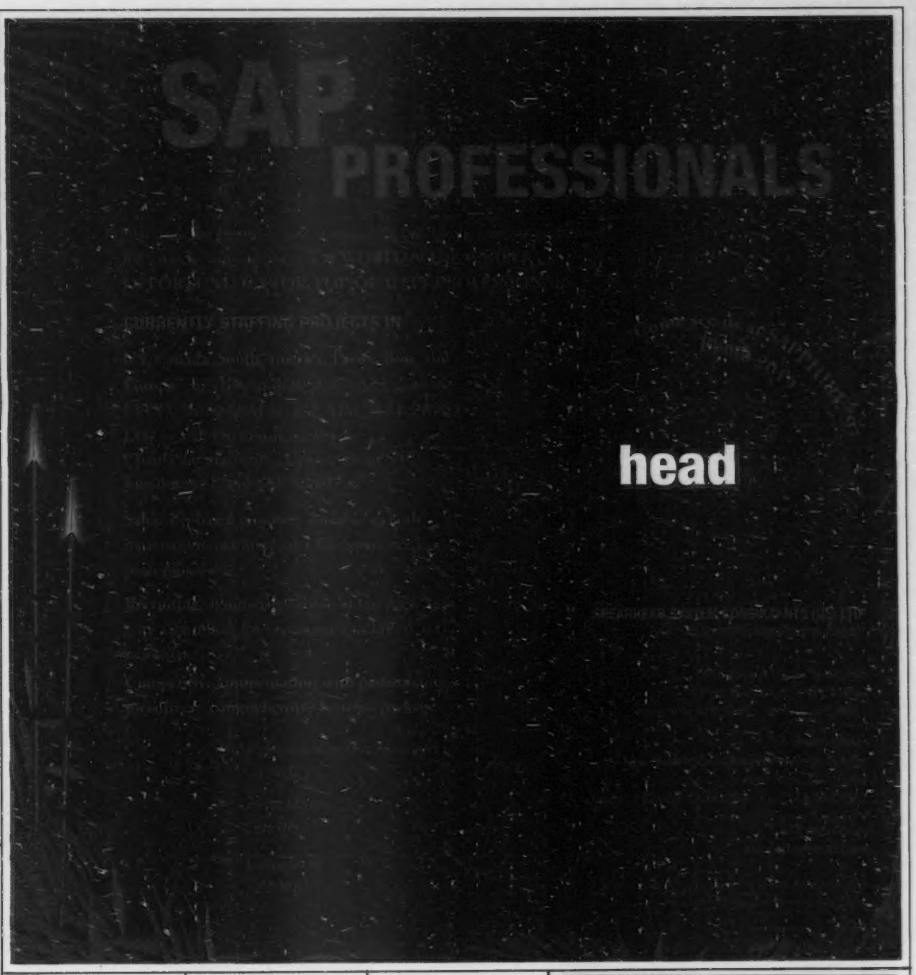

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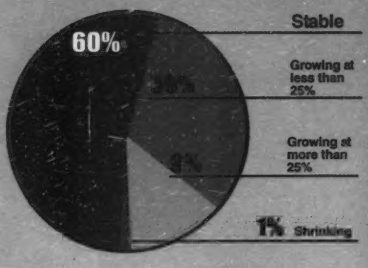

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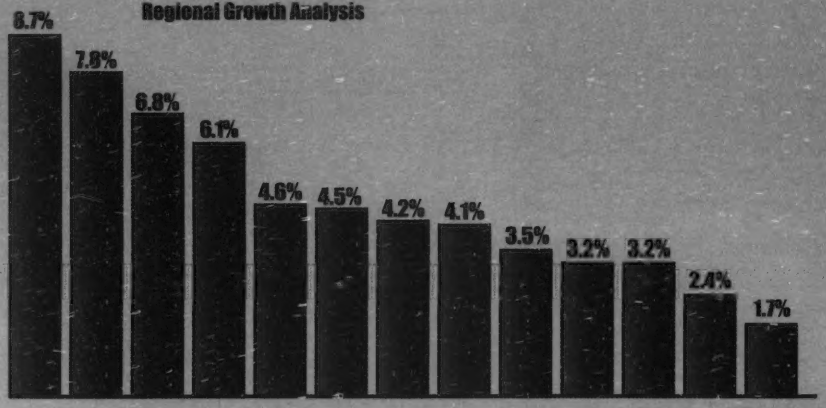

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CorpTech, a directory publisher in Woburn, Mass., tracks the U.S. 45,000 technology manufacturers. This survey relates to the 31,042 tracked firms with fewer than 1,000 employees.

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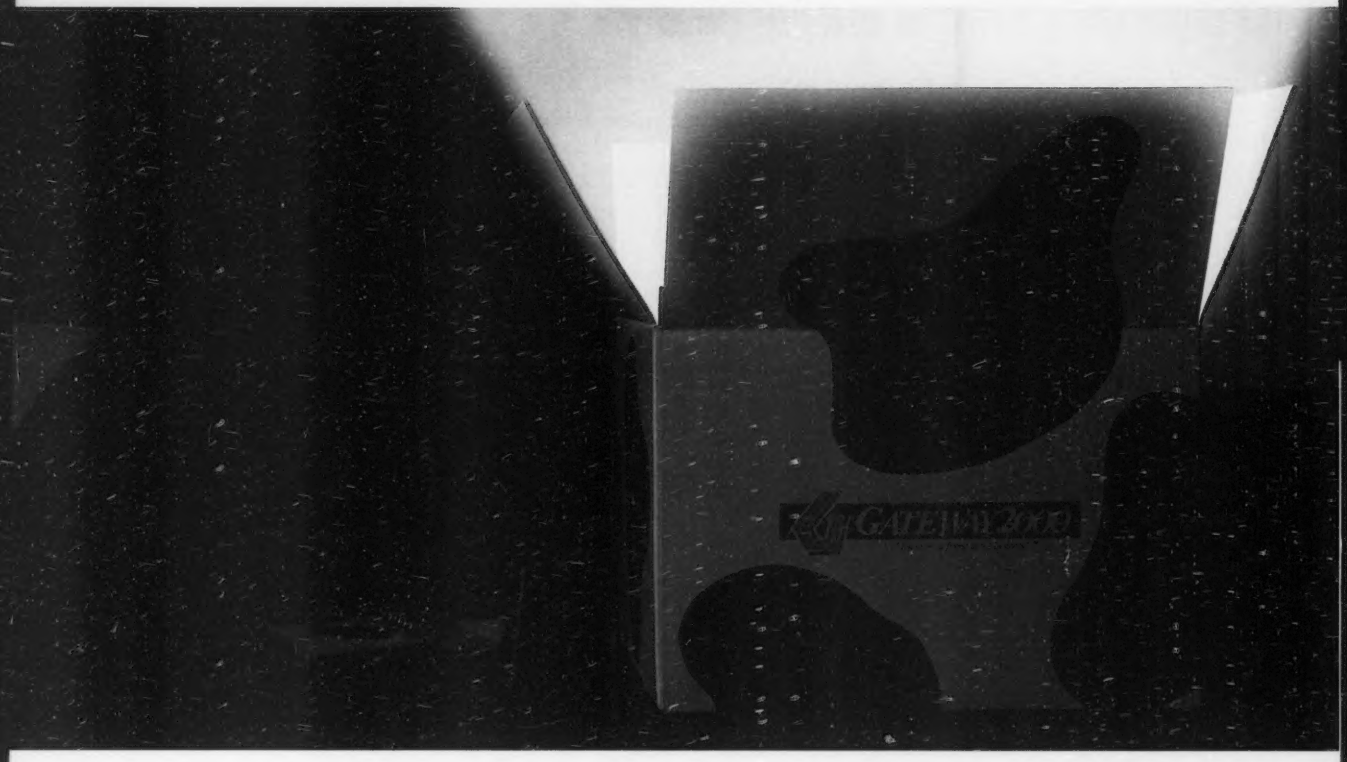

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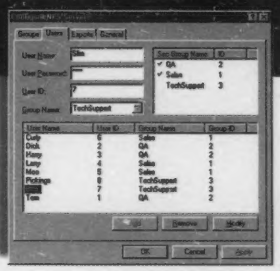

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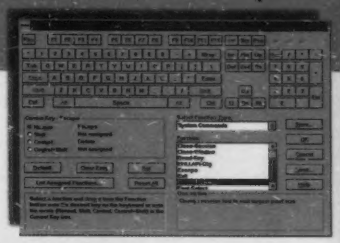

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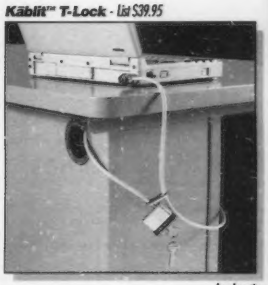

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For winners list (available after 6/30/98) send self-addressed, stamped envelope by 1/15/98 to: Super Prize Winners, P. O. Box 9193, Medford, NY 11763-8193.

THE FOLLOWING APPLIES TO THE SWEEPSTAKES ABOVE - No purchase, payment or contribution necessary to enter or win. No photocopied or mechanically reproduced entries will be accepted. Not responsible for technical malfunctions, failure of computer, telephone equipment or software, inaccurate transmission of entry information or for lost, late, misdirected, damaged, incomplete, illegible or postage-due mail. All entries become the property of sponsors and none will be returned.

Winner notification will be by mail. A winner may be required to sign and return an Affidavit of Eligibility/Liability/Publicity Release within 14 days of date printed on notification or he/she will be disqualified. Any prize/prize notification returned as undeliverable will result in disqualification. If a major prize is won by a minor, it will be awarded to parent or legal guardian and the Affidavit of Eligibility and Release must be signed by the parent or legal guardian. Except where prohibited by law, winners consent to the use of their names, hometowns, likenesses and photographs for advertising and publicity without additional compensation.

Sweepstakes is open to legal residents of the U. S., Canada and Europe (in those areas where made available) who have received the offer. In the event that the designated recipient of the offer has moved, the offer may not be valid in the state, country or province to which the offer has been forwarded. Void in Puerto Rico and where prohibited by law. All federal, state, provincial and local laws and regulations apply.

All prize values are in U. S. currency. No transfer of prize permitted. A winner is responsible for all taxes on his/her prize.

Canadian residents, in order to win, must first correctly answer a time-limited skill testing question administered by mail. Any litigation regarding the conduct and awarding of a prize in this publicity contest by a resident of the province of Quebec may be submitted to the Regie des alcools, des courses et des jeux.

Sweepstakes may be presented in different creative presentations by different organizations. Ventura Associates, Inc., 1040 Avenue of the Americas, New York, NY 10018, the independent judging organization has provided all prizes at no charge. Ventura Associates, Inc., reserves the right to withdraw the promotion if it becomes technically corrupted.

Employees of Sweepstakes Administrator, presenting organizations, their advertising agencies and promotional companies involved in this promotion and their families, agents, successors and assignees are ineligible to participate in the promotion and shall not be eligible for any prizes covered herein. The parties hereto acknowledge that SCA is not liable for any prize awards payable to promotion participants in violation of this term.

COMPUTERWORLD TECHNOTOYS WEEKLY SWEEPSTAKES OFFICIAL RULES: No purchase necessary. Complete official entry form or print all entry information on plain paper, including this week's prize and fax to: (800)888-2299. Incomplete entries not eligible. Sweepstakes begins 12:01 am (EST) Monday (the date of the issue). All entries must arrive by fax no later than 11:59 am Monday of the following week. The issue data can be found at the top of most pages of this magazine. Sponsor not responsible for telephone or fax equipment failure or delayed transmission. All entries become sponsor's property & will not be returned.

Winner will be determined in a random drawing on or about 5:00 pm (EST) the Monday following the issue date. You need not be present to win. The prize (and its retail value) detailed with the entry form is guaranteed to be awarded & delivered to winner approx. 30 days from drawing date. If notification letter or prize is returned as undeliverable, it will be awarded to an alternate winner at random. No prize substitutions except due to unavailability, in which case a prize of equal value will be awarded. Prize not transferable or redeemable for cash. All taxes on prize are winner's responsibility. Acceptance of prize constitutes permission (except where prohibited) to use winner's name, hometown & likeness for promotional purposes without additional compensation.

Sweepstakes is open to legal US residents, 18 & older. Odds of winning determined by total number of entries received. Est. distribution: 150,448. Sponsor: Computerworld, Inc. 500 Old Connecticut Path, Framingham, MA 01701. Employees of Computerworld, Inc., its affiliates, subsidiaries, retailers, advertising & promotion agencies & immediate families of each not eligible. All federal, state & local laws & regulations apply. Void in Puerto Rico & where prohibited by law.

For winners list (available within 4 weeks of the drawing), send a SASE to: Sweepstakes Winners, Computerworld TechnoToys Sweepstakes, 500 Old Connecticut Path, Framingham, MA 01701.

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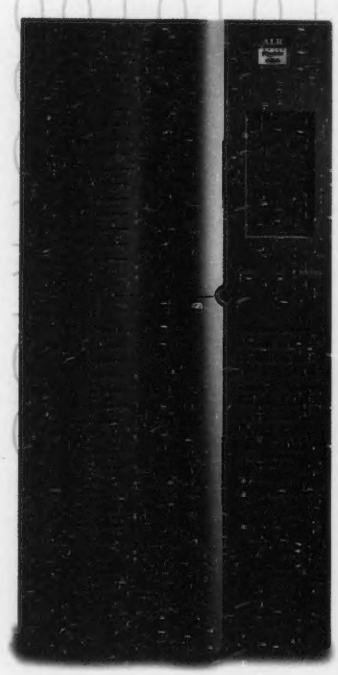

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Rank	Manuf.	System	Throughput (tpmC)	Price/Performance ($per tpmC)	Qty/Processors/MHz
1	ALR®	Revolution™ 6x6 c/s	10,665.53	$48.10	6/Pentium Pro/200MHz
1	Unisys®	Aquanta™ HS/6 c/s	10,665.53	$53.43	6/Pentium Pro/200MHz
2	Unisys®	Aquanta™ HS/6 c/s	4,223.43	$82.59	4/Pentium Pro/200MHz
3	HP®	NetServer™ LX Pro c/s	9,198.37	$49.62	4/Pentium Pro/200MHz
4	NCR®	WorldMark™ 4300S c/s	9,116.00	$85.45	4/Pentium Pro/200MHz
5	Compaq®	ProLiant™ 6000 6/200 Model 1X c/s	9,028.67	$78.17	4/Pentium Pro/200MHz
6	Compaq®	ProLiant™ 6000 6/200 Model 2 c/s	9,311.43	$85.37	4/Pentium Pro/200MHz
7	Digital®	Fxforis™ ZX 6200MP	8,145.60	$48.67	4/Pentium Pro/200MHz
8	Compaq®	ProLiant™ 6000 6/200 Model 1X c/s	8,070.00	$57.86	4/Pentium Pro/200MHz

Product comparison chart below is not representative of the machines used in these benchmarks. * Data current on 7/25/97.
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	ALR Revolution 2XL	ALR Revolution 6X6	Compaq Proliant 6000
CPU	(1) Pentium II 266/512	(1) Pentium® Pro 200/512	(1) Pentium® Pro 200/512
Maximum No. of Processors	2 (Pentium Pro or Pentium II)	6	4
Memory	64-MB	128-MB	128-MB
Hard Disk Drive Storage	4-Gigabyte (FW ultra SCSI)	9-Gigabyte (FWSCSI)	9-Gigabyte (FWSCSI)
LCD Touchscreen Diagnostics	Not Available	Standard	Not Available
CD-ROM	16X (IDE)	16X (SCSI)	8X (SCSI)
RAID Ready	6 Bays	6 Bays	6 Bays
Hot Swappable Expansion	3 Bays (Optional)	6 Bays	6 Bays
Network Interface	10/100 Ethernet	10/100 Ethernet	10/100 Ethernet
On-board Disk Controller	Fast/Wide Ultra SCSI & IDE	Fast/Wide Ultra SCSI & IDE	Fast/Wide Ultra SCSI & IDE
Server Management	ALR InforManager™ with Active CPR™	ALR InforManager™ with ActiveCPR™	Compaq Insight Manager™
N+1 Power Supply	Dual 365 Watts with Loadshare	750 Watts (1050 opt.)	750 Watts
Redundant Hot-pluggable	Not Available	Standard	Optional
On-site Service	3 Years On-site Service	3 Years On-site Service	3 Years On-site Service
Factory Warranty	5 Years/30 Months	3 Years/36 Months	3 Year
IDC Estimated Street Price	4,783	12,763	13,431

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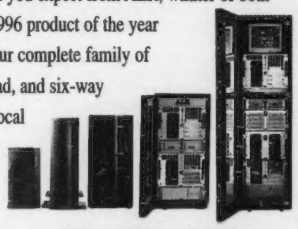

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The Week in Stocks

Gainers

PERCENT

System Software Assoc.	47.9
Applix Inc.	29.2
Rettx	20.9
Lycos Inc.	18.5
Micro Focus	15.7
Software Spectrum Inc.	14.5
Ross Systems, Inc.	14.3
CompUSA Inc.	14.3

DOLLAR

Micro Focus	4.75
Micrel Semiconductor Inc.	4.50
System Software Assoc.	4.19
CompUSA Inc.	3.81
Lycos Inc.	3.00
Hyperion Software Corp.	2.63
Nynex Corp.	2.56
Bell Atlantic Corp.	2.50

Losers

PERCENT

ParcPlace Systems Inc.	-25.6
Micron Technology(H)	-23.1
Centura Software	-18.0
Micron International Inc.	-15.3
Radius Inc.	-15.0
MathSoft	-14.0
Data Race Inc.	-13.4
Novell Inc.	-13.1

DOLLAR

Micron Technology(H)	-13.06
Microsoft Corp.	-5.88
McAfee Associates	-4.44
Northern Telecom Ltd.	-3.88
Intel Corp.	-3.88
Xilinx	-3.88
Lattice Semiconductor	-3.81
Ascend Communications	-3.56

INDUSTRY ALMANAC

Avid posts vigorous gains

After a year of losses, Avid Technology, Inc. (Nasdaq: AVID) surpassed expectations with consecutive gains in the first and second quarters of this year. Revenue for the first six months of this year was $231.1 million, up 14.9% from the $201.1 million for the same period last year.

The Tewksbury, Mass., company produces digital video and audio editing systems that are used in the film, television, broadcast and online industries. Its products convert video and audio signals from analog to digital and include tools for automated data capture, storage, manipulation and output.

Analysts attribute the rejuvenated performance to Avid's successful product updates and a growing indirect channel.

"Avid was massively ahead of forecast, and we expect this trend to continue," says Alex Henderson, an analyst at Prudential Securities, Inc. in New York. Prudential has a Buy recommendation on Avid shares.

A report from Robertson Stephens & Co. in Boston also forecasts continued gains for Avid. The report says that although many of Avid's competitors have fallen by the wayside, there is still a big revenue opportunity for video editing. Robertson Stephens considers the stock "long-term attractive" for investors.

Avid's competitors haven't done as well because the digital video editing market still has low penetration in its target markets, and there are no real software standards for it yet. Also, the market isn't very stable and has lots of slow periods, analysts say.

Avid has managed to succeed because it has stuck to its strong core products. It also has managed to effectively trim operating costs to improve its bottom line. — Nancy Dillon

Avid's digital editing, audio and special effects tools are used by many television programs, including *Seinfeld*

Exch	52-Week High	52-Week Low		Aug. 15 2 PM	Wk Net Change	Wk Pct Change
Communications and NetCard Services						**UP 1.23%**
COMS	81.38	24.00	3 COM Corp.	55.13	-0.63	-1.1
AIT	71.75	49.63	AMERITECH Corp.	67.13	1.13	1.7
ASND	80.25	36.13	Ascend Communications	46.06	-3.56	-7.2
T	42.63	30.75	AT&T	39.13	-0.94	-2.3
BNYN	6.50	1.19	Banyan Systems Inc.	2.38	0.28	13.4
BAY	34.00	15.38	Bay Networks Inc.	33.31	1.81	5.8
BEL	78.25	53.13	Bell Atlantic Corp.	75.00	2.50	3.4
BLS	48.81	35.25	Bellsouth Corp. (H)	45.50	-0.50	-1.1
BRKT	42.25	9.25	Brooktrout Technology	9.69	-0.31	-3.1
CS	46.50	27.50	Cabletron Systems	33.00	-1.13	-3.3
CGRM	17.50	8.63	Certicham Communications	11.13	-0.38	-3.3
CSCO	83.25	45.25	Cisco Systems Inc.	75.75	-1.44	-1.9
CMNT	7.00	3.31	Computer Network Tech.	4.25	0.50	13.3
DIGI	32.75	12.63	DSC Communications	27.06	-0.56	-2.0
FORE	43.63	10.00	FORE Systems Inc.	18.69	0.81	4.5
GDC	12.50	6.13	General Datacomm Inds.	7.31	-0.19	-2.5
GSX	53.00	36.13	General Signal Networks	45.81	-1.44	-3.0
GTE	49.38	37.75	GTE Corp.	46.88	0.38	0.8
LU	90.75	35.88	Lucent Tech.	83.63	-1.19	-1.4
MADGF	16.13	4.50	Madge Networks NV	6.44	0.38	6.2
MCIC	43.38	23.88	MCI Communications Corp.	33.13	-0.38	-1.1
NETM	10.50	2.50	NetManage Inc.	3.44	0.09	2.8
NTRX	8.50	1.44	Netrix Corp.	2.00	0.00	0.0
NCDI	16.25	4.25	Network Computing Devices	8.88	0.69	8.4
NWK	22.38	11.13	Network Equipment Tech.	20.81	-0.19	-0.9
NETG	30.25	11.13	Network General	16.25	-0.31	-1.9
NN	52.44	22.50	Newbridge Networks Corp.	43.06	-2.69	-5.9
NT	107.19	48.50	Northern Telecom Ltd.	98.56	-3.88	-3.8
NOVL	13.00	6.28	Novell Inc.	8.06	-1.22	-13.1
NYN	59.88	42.00	Nynex Corp.	58.00	2.56	4.6
OCTL	31.75	13.50	Octel Communications Corp.	30.31	-0.31	-1.0
ODSI	24.25	9.75	Optical Data Systems Inc.	10.63	-0.25	-2.3
PCTL	38.00	8.25	Picturetel Corp.	10.38	-0.13	-1.2
PTON	4.25	1.31	Proteon Inc.	1.75	0.06	3.7
RACO	6.38	1.50	Racotek Inc.	1.56	0.06	4.2
RETX	9.25	3.38	Retix	5.06	0.88	20.9
SBC	62.25	46.00	SBC Communications	56.31	-1.44	-2.5
SFA	24.94	12.38	Scientific Atlanta Inc. (H)	23.31	1.50	6.9
SHVA	63.50	8.25	Shiva Corp.	11.63	0.44	3.9
FON	52.75	37.50	Sprint Corp.	46.63	-0.63	-1.3
SMSC	15.25	8.25	Standard Microsystems Corp.	10.50	-0.50	-4.5
USW	39.44	27.25	U S West Inc.	37.63	0.25	0.7
XIRC	31.13	7.50	Xircom	13.88	-0.13	-0.9
XYLN	59.38	12.38	Xylan Corp.	17.69	2.00	12.7
PCs and Workstation						**UP 4.15%**
AAPL	29.56	12.75	Apple Computer Inc. (H)	23.13	-3.44	-12.9
ASTA	8.38	3.94	AST Research Inc.	5.31	0.00	0.0
CPQ	63.00	30.13	Compaq Computer Corp. (H)	58.06	-1.50	-2.5
DELL	86.75	13.88	Dell Computer Corp.	82.50	1.56	1.9
GTW	46.25	19.38	Gateway 2000 Inc.	37.25	2.38	6.0
HWP	71.50	39.75	Hewlett Packard Co. (H)	67.06	-1.31	-1.9
MUEI	25.38	12.63	Micron International Inc.	16.25	-2.94	-15.3
NIPNY	74.00	52.50	NEC America	69.25	1.88	1.3
SGI	28.81	12.63	Silicon Graphics	26.44	-0.31	-1.2
SUNW	50.38	25.50	Sun Microsystems Inc. (H)	46.31	-2.44	-5.0
Large Systems						**UP 1.59%**
AMH	14.00	8.13	Amdahl Corp.	11.94	0.06	0.5
DGN	32.75	10.25	Data General Corp. (H)	32.38	2.38	7.9
DEC	47.81	23.00	Digital Equipment Corp. (H)	46.00	2.13	4.8
IBM	109.44	54.63	IBM	103.31	-1.88	-1.8
MDCD	9.75	2.88	Meridian Data Inc.	4.19	0.13	3.1
NETF	4.38	0.88	NetFrame	0.97	-0.03	-3.1
PRCM	20.13	8.00	ProCom Technology, Inc.	10.75	-0.63	-5.5
SQNT	31.25	10.75	Sequent Computer Sys.	27.38	-0.50	-1.8
TEXM	3.88	2.00	Sequoia Systems Inc.	3.25	0.28	9.5
SRA	57.25	17.25	Stratus Computer Inc.	54.19	-1.50	-2.7
TDM	32.36	10.25	Tandem Computers Inc. (H)	30.38	-0.38	-1.2
UIS	11.25	5.75	Unisys Corp.	11.00	0.94	9.3
Software						**UP 0.33%**
ADBE	49.00	31.50	Adobe Systems Inc.	41.00	2.00	5.1
AMSWA	11.50	4.50	American Software Inc. (H)	10.00	-0.06	-0.6
APLX	40.00	3.13	Applix Inc.	7.75	1.75	29.2
ARSW	45.00	17.00	Arbor Software	39.63	-0.88	-2.2
ADSK	46.50	18.50	Autodesk Inc.	43.00	-0.63	-1.4
BGSS	32.50	20.88	BGS Systems Inc.	30.00	2.25	8.1
BMCS	63.63	33.25	BMC Software Inc.	60.25	-1.50	-2.4
BOOL	27.63	15.63	Boole and Babbage	26.38	0.13	0.5
BORL	9.81	4.75	Borland Int'l. Inc. (H)	9.13	0.19	2.1
BOBJY	22.00	6.63	Business Objects	7.00	-1.00	-12.5
CAYN	6.25	2.25	Cayenne Software Inc. (L)	2.25	-0.13	-5.3
CNTR	5.88	1.13	Centura Software	1.56	-0.34	-18.0
CHKPF	36.25	15.63	Checkpoint Software Technologies	28.19	-2.06	-8.2
COGNF	39.50	20.88	Cognos Inc.	29.75	0.94	3.3
CA	71.81	37.25	Computer Associates	63.63	-3.44	-5.1
CVN	10.38	3.13	Computervision Corp.	3.19	-0.13	-3.8
CPWR	62.88	20.25	Compuware Corp.	62.88	1.88	3.1
CSRE	19.00	8.06	Comshare Inc. (L)	8.13	-0.63	-7.1
COSFF	10.75	5.00	Corel Corp.	6.50	0.63	10.6
DWTI	6.63	2.25	Datawave Technologies Inc.	3.00	-0.13	-4.0
FILE	36.50	9.50	Filenet Corp.	19.00	-0.81	-4.1
FRTE	47.00	7.25	Forte Software	11.69	-0.06	-0.5
FTPS	9.50	3.50	FTP Software Inc.	3.63	-0.13	-3.3
HUMCF	41.63	22.00	Hummingbird Comm. Ltd.	36.25	-1.75	-4.6
HYSW	28.75	11.88	Hyperion Software Corp.	28.38	2.63	10.2
IRC	18.25	11.13	Information Resources (H)	17.69	0.69	4.0
IFMX	31.13	6.56	Informix Corp.	9.25	-0.06	-0.7
INGR	12.63	6.25	Intergraph Corp.	9.63	0.00	0.0
LEAF	4.50	0.81	Interleaf Inc.	2.72	-0.16	-5.4
ISLI	16.63	6.25	Intersolv Inc.	15.63	1.13	7.8
INTU	40.25	20.88	Intuit Inc.	25.47	-1.84	-6.8
TLC	25.75	5.50	Learning Co. (The)	10.94	0.19	1.7
LGWX	10.50	4.13	Logic Works	8.00	-0.38	-4.5
MAPS	13.00	7.88	Mapinfo Corp.	12.13	0.13	1.0
MATH	7.00	2.19	MathSoft	2.69	-0.44	-14.0
MCAF	78.50	36.50	McAfee Associates	59.44	-4.44	-6.9
MENT	14.38	6.50	Mentor Graphics	9.88	-0.19	-1.9
MIFGY	35.00	10.50	Micro Focus	35.00	4.75	15.7
MGXI	12.38	4.00	Micrograte Inc.	6.50	0.31	5.1
MSFT	150.75	60.38	Microsoft Corp.	134.88	-5.88	-4.2
ORCL	59.00	33.63	Oracle Corp.	57.19	1.06	1.9
PMTC	64.25	37.50	Parametric Technology	46.38	-0.38	-0.8
PARQ	5.25	0.88	ParcPlace Systems Inc.	1.00	-0.34	-25.6
PSFT	66.38	30.63	Peoplesoft	55.75	-2.25	-3.9
PTEC	19.75	11.00	Phoenix Technologies	13.50	0.13	0.9
PSQL	13.75	6.50	Platinum Software	10.50	-0.44	-4.0
PLAT	18.63	10.13	Platinum Technology (H)	18.13	1.00	5.8
PRGS	23.00	12.63	Progress Software Corp.	18.31	0.75	4.3
RNBO	22.13	13.75	Rainbow Technologies Inc.	17.75	-0.56	-3.1
REDB	28.00	5.00	Red Brick Systems Inc.	8.63	0.47	5.7
ROSS	9.75	1.75	Ross Systems, Inc.	5.00	0.63	14.3
SAPE	61.00	30.00	Sapient Corp. (H)	56.50	1.00	1.8
SCOC	8.63	3.13	SCO Inc.	4.81	0.44	10.0
SDTI	44.38	21.00	Security Dynamics Tech.	37.75	-2.88	-7.1
SOTA	17.50	8.88	State of the Art	12.75	1.00	8.5
SSW	78.88	27.25	Sterling Software Inc.	32.44	-0.13	-0.4
SDRC	29.13	16.75	Struct. Dynamics Research	26.25	-0.50	-1.9
SYBS	21.13	12.13	Sybase Inc.	15.75	-0.19	-1.2
SYMC	25.63	8.75	Symantec Corp. (H)	22.81	-1.63	-6.6
SNPS	50.50	21.75	SynOpsys	34.63	-0.69	-1.9
SSAX	14.22	3.88	System Software Assoc.	12.94	4.19	47.9
SYSF	36.50	7.38	Systemsoft Corp.	12.13	-0.88	-6.7
TRUV	6.00	1.50	Truevision Corp.	1.88	0.00	0.0
VIEW	17.38	8.38	ViewLogic Systems	17.38	1.38	8.6
VMRK	10.00	5.50	Visual Software Inc.	8.50	-0.50	-5.6
WALK	16.25	10.38	Walker Interactive Systems	13.56	-0.44	-3.1
WALL	29.13	12.25	Wall Data Inc.	17.75	0.00	0.0
WANG	24.06	16.00	Wang Laboratories Inc.	20.31	0.84	4.3
Internet						**UP 16.12%**
AMZN	30.88	15.75	Amazon.com	24.56	-1.06	-4.1
AOL	75.50	22.38	America On-Line	67.00	-2.50	-3.6
ATHM	25.50	16.63	At Home Corp.	19.75	-0.38	-1.9
BBN	29.38	15.13	BBN Corp.	28.88	0.00	0.0
CSRV	16.75	8.63	Compuserve Corp.	12.31	0.81	7.1
EDFY	25.75	8.88	Edify Corp.	13.38	-0.88	-6.1
XCIT	21.63	5.00	Excite, Inc.	17.13	1.63	10.5
SEEK	11.50	4.38	Infoseek Corp.	5.00	-0.47	-8.6
LCOS	22.75	6.00	Lycos Inc.	19.25	3.00	18.5
NETC	24.25	7.88	Netcom On-Line	13.38	0.25	1.9
NSCP	65.00	23.50	Netscape Comm. Corp.	38.63	-1.50	-3.7
OMKT	25.50	6.50	Open Market Inc.	10.63	-0.25	-2.3
PSIX	14.50	5.50	PSINet	8.13	-0.13	-1.5
QDEK	9.25	2.00	Quarterdeck Corp.	2.56	0.00	0.0
RAPT	25.75	8.88	Raptor Systems	11.88	1.06	9.8
SCUR	16.00	4.75	Secure Computing Corp.	5.75	-0.25	-4.2
SPYG	20.25	6.00	Spyglass Inc.	8.44	-0.25	-2.9
YHOO	56.50	16.75	Yahoo! Inc.	48.75	-3.44	-6.6
Semiconductors						**UP 1.67%**
AMD	48.50	12.13	Advanced Micro Devices	37.44	0.94	2.6
ADI	33.88	14.63	Analog Devices Inc.	32.69	1.50	4.8
CHPS	26.50	7.88	Chips and Technologies	17.00	0.13	0.7
CRUS	24.25	8.00	Cirrus Logic	14.53	-0.34	-2.3
CY	17.13	10.00	Cypress Semiconductor Corp.	14.88	-1.13	-7.0
CYRX	30.00	11.50	Cyrix	27.06	-0.50	-1.8
INTC	102.00	39.25	Intel Corp.	94.00	-3.88	-4.0
LSCC	71.63	24.00	Lattice Semiconductor	63.06	-3.81	-5.7
LSI	46.88	20.13	LSI Logic Corp.	33.38	0.88	2.7
MCRL	70.63	17.63	Micrel Semiconductor Inc.	69.50	4.50	6.9
MU	60.06	20.38	Micron Technology (H)	43.44	-13.06	-23.1
MOT	90.50	44.13	Motorola Inc.	81.00	1.63	2.0
NSM	37.56	15.13	National Semiconductor	33.50	-0.19	-0.6
TXN	131.31	43.63	Texas Instruments (H)	119.81	-1.69	-1.4
VLSI	34.25	12.50	VLSI Technology	31.94	0.69	2.2
XLNX	58.50	29.88	Xilinx	50.50	-3.88	-7.1
ZLG	29.50	14.88	Zilog Inc.	24.31	0.06	0.3
Peripherals and Subsystems						**UP 1.33%**
ADPT	48.63	23.38	Adaptec Inc. (H)	47.81	1.69	3.7
APCC	31.50	12.00	American Power Conversion	25.88	-1.75	-6.3
CREAF	25.25	3.50	Creative Technology Ltd.	21.00	0.00	0.0
RACE	24.50	6.00	Data Race Inc.	8.50	-1.31	-13.4
DTM	12.50	6.75	Dataram Corp.	8.50	-0.25	-2.9
EMC	54.00	18.88	EMC Corp. (H)	50.75	-0.94	-1.8
EMLX	21.25	13.00	Emulex Corp.	15.75	0.00	0.0
ESCC	29.75	20.00	Evans and Sutherland	29.25	0.50	1.7
EXBT	17.50	9.50	Exabyte	11.19	-0.38	-3.2
IISLF	2.63	1.13	Intelligent Inpo. Systems	1.28	0.03	2.5
IOM	27.00	12.63	Iomega Corp.	22.88	-0.50	-2.1
IPLS	2.75	0.94	IPL Systems Inc.	1.69	0.19	12.5
KMAG	36.75	15.31	Komag Inc.	18.94	0.31	-1.6
MTSI	30.38	12.88	Micro Touch Systems Inc.	30.00	2.25	8.1
MTIC	8.00	1.69	MTI Technology Corp.	7.25	0.00	0.0
PNCL	8.75	0.59	Pinnacle Micro Inc.	0.69	-0.06	-8.3
AQM	6.38	2.38	QMS Inc.	2.94	-0.06	-2.1
QNTM	36.50	6.88	Quantum Corp.	34.75	0.25	0.7
RDUS	2.19	0.19	Radius Inc.	0.53	-0.09	-15.0
SEG	56.25	22.63	Seagate Technology	43.00	0.25	0.6
SOS	19.63	9.75	Storage Computer Corp.	12.13	0.13	1.0
STK	54.38	32.63	Storage Technology	49.69	0.00	0.0
TEK	65.25	37.00	Tektronix Inc.	59.50	-1.63	-2.7
WDC	51.25	16.50	Western Digital Corp. (H)	49.31	1.44	3.0
XRX	84.50	44.63	Xerox Corp.	75.63	-2.13	-2.7
Services						**UP 0.06%**
AMSY	37.13	15.75	American Mgmt. Systems	23.50	-0.63	-2.6
ANLY	41.75	17.50	Analysts Int'l.	39.25	-1.25	-3.1
AUD	50.44	39.50	Auto Data Processing	46.00	-0.56	-1.2
BDMI	30.75	19.75	BDM International Inc.	26.50	1.50	6.0
CATP	38.94	21.25	Cambridge Tech. Partners	33.94	-1.06	-3.0
CEN	53.13	29.50	Ceridian Corp.	43.06	0.38	0.9
CDO	29.44	17.38	Comdisco Inc.	27.31	-0.19	-0.7
CPU	30.88	13.25	CompUSA Inc.	30.56	3.81	14.3
CHRZ	45.63	13.38	Computer Horizons	36.50	-2.88	-7.3
CSC	86.50	57.88	Computer Sciences	76.50	-2.13	-2.7
TSK	49.19	14.00	Computer Task Group	44.94	-1.63	-3.5
CDAT	28.63	12.75	Control Data Systems Inc.	19.88	-0.25	-1.2
EGGS	8.38	3.63	Egghead Discount Software	6.00	0.19	3.2
EDS	63.38	31.75	Electronic Data Systems Corp.	37.75	1.00	2.7
INAC	40.63	19.75	Inacom Corp.	33.38	-0.69	-2.0
INEL	10.75	2.25	Intelligent Electronics	3.75	0.13	3.4
KEA	70.00	19.75	Keane Inc.	59.00	-3.31	-5.3
MICA	25.00	12.31	Microage Inc.	22.75	0.50	2.2
PAYX	42.50	25.63	Paychex	37.63	-1.38	-3.5
PMS	56.06	33.13	Policy Management Sys. (H)	55.50	0.63	1.1
REY	30.63	13.75	Reynolds and Reynolds	19.25	0.56	3.0
SCBI	27.00	16.00	SCB Computer Tech. Inc.	24.88	-0.38	-1.5
SEIC	30.00	18.75	SEI Corp.	28.81	0.19	0.7
SMED	61.75	36.75	Shared Medical Systems	48.94	0.56	1.2
SSPE	33.50	10.00	Software Spectrum Inc.	16.03	2.03	14.5
SDS	54.25	37.00	Sungard Data Systems	49.06	-0.63	-1.1
VST	29.75	6.50	VanStar Corp.	14.00	0.13	0.9

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Mega-warehouse as marketing tool

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The project, which started in HFS's marketing department, was formally launched about 18 months ago and is expected to wrap up next month.

The objective is to use the consolidated information in new, highly targeted cross-brand promotions aimed at increasing the market share of each HFS brand.

By using the warehouse to provide a single view of customers and their buying preferences across all brands, the company theoretically should be able to target customers with promotional offers tailored to their specific profiles. For example, regular Avis renters could get special discounts at HFS hotels, or time-share purchasers could get special rates on Avis rentals.

REWARDING LOYALTY

"The idea is to reward our customers for their loyalty and bring to the table additional offers at the right time and the right place," said Scott Anderson, vice president and chief marketing officer at HFS. "We think it is going to be a significant value-add to our business."

If HFS can pull it off, the company will have succeeded in doing what corporations everywhere are struggling to do: find a way to harness and shape vast amounts of widely dispersed enterprise data into a powerful business and marketing tool.

Such capabilities will be crucial for HFS, particularly in light of its recent acquisition by Stamford, Conn.-based direct marketing giant CUC International, Inc. One of the goals of that deal is for the companies to cross-market to one another's customers [CW, June 9].

No decision has been made on if and how CUC systems will be merged with the unified HFS warehouse, Anderson said.

"Qualitatively, it is no different from what happens when two different companies merge with each other," said Ken Rudin, a partner at Emergent Corp., a consultancy and integrator in San Mateo, Calif. "You have two sets of data with entirely different personalities that you somehow [have] to merge with each other," he said. But in HFS's case, it is more like 15 different sets of data. And getting there isn't easy.

BUILDING FROM SCRATCH

Integration of the type HFS is trying to achieve involves melding different databases, data models, product codes and data collection methods and then building a warehouse from scratch.

The HFS warehouse will be powered by Digital Equipment Corp. symmetrical multiprocessing Alpha servers running an Informix Corp. database engine. The data being fed into it comes from a mix of mainframe, Oracle Corp., Sybase, Inc., Informix and Microsoft Corp. SQL Server databases.

"Digital's 64-bit architecture, their scalability and their support for Very Large Memory provided what we were looking for from the hardware," said Clyde Bryant, manager of database technology at HFS.

The decision to go with Informix was made last year. Tilting the balance in its favor were its partitioning capabilities and features such as the 64-bit and large file support on the Informix 7.23 database, Bryant said.

The data comes from the tens of millions of customer transactions involving HFS brands every year. For example, HFS collects information from about 45 million room reservations, 15 million Avis rentals, 1.5 million real estate sites and about 2 million time-share reservations. To build the warehouse, HFS had to extract, clean, convert and move relevant data from each of those sources to the centralized database.

FAST GROWTH

The completed warehouse will start at a relatively modest 500G bytes but is expected to nearly triple to 1.2T bytes by early next year.

"It took almost a year of constant interaction with our brands just to decide what information we wanted to collect, how we were going to collect it and from where," Anderson said.

After testing many of the data acquisition and cleansing tools available in the market — and rejecting them for being too expensive or inflexible — the integration team finally decided to develop its own technology for collecting data from multiple sources and feeding the data to a central warehouse (see related story, above).

The result was HFS's proprietary "universal message format," which at a basic level defines what kind of information should get into the central warehouse. It also provides a standard set of specifications for exactly how the data gets mapped into the warehouse.

"The basic driver for anything like this is the competition. If you look at the real estate business, for instance, our brands have about 25% of the marketplace. That means there's 75% of sites out there that don't have our flag. That's the opportunity we want to tap" with these technologies, Anderson said. □

Support choices were critical

The centralized warehouse project, which was managed out of HFS's data center in Phoenix, was put together by its information systems staff and a group of systems integration firms.

They included Deloitte & Touche, System Research and Development, Inc. (SRD) and Digital.

"The project was bigger than the warehouse. We needed to find vendors who were willing to partner with us, understand our objectives and help us define our architecture," said Clyde Bryant, manager of database technology at HFS.

"Considering the sheer size and magnitude of this project, it was very important that we pick outside vendors that could support the management capabilities required" and understand our data warehouse architecture, Bryant said.

As project manager, Deloitte & Touche coordinated the effort, including day-to-day management. Lead integrator SRD helped with things such as data modeling and building front-end tools and user screens. Digital was the main technology provider and supplied its high-end 64-bit Alpha servers. Digital also worked with SRD to develop the warehouse architecture. — Jaikumar Vijayan

Intel card wakes up sleeping PCs for remote maintenance

By Bob Wallace

IS MANAGERS can now perform easy off-hours PC maintenance, which lowers support costs, using a new breed of adapter card from Intel Corp.

The new EtherExpress card lets managers remotely turn on, boot up and service PCs from a central location. Those are capabilities vendors have been pushing with network computers as a way to cut the total cost of PC ownership.

The card uses IBM's Wake-on-LAN technology, which is also being used in network computers.

NEC America, Inc. and IBM said they are committed to using the new EtherExpress adapter in their PCs. Intel said several other PC makers will follow suit but it wouldn't identify them.

Chuck Rush said he doesn't believe the PC adapter will keep his company from investing in network computers.

"I think the consideration for network computers is really just a matter of cost," said Rush, global network architect at McDonald's Corp. in Oakbrook Terrace, Ill. "We're looking at NCs, but we're not 100% sold on them."

Intel also offers the LANDesk Service Agent, a preboot agent that enables new PCs to be booted from a remote management server for installation or upgrading of operating systems and applications.

Wake-on-LAN enables a PC to be remotely turned on for automated management services, including virus scans, software updates and ongoing maintenance during off-hours. □

& **Intel-based workstations lower costs for power-hungry users. Page 67**

GAO blasts DOD's year 2000 method

By Sharon Machlis

THE U.S. DEFENSE Department's method of tracking potential year 2000 problems throughout the military "is not a reliable and accurate tool for managing [its] year 2000 efforts," according to a report released by the General Accounting Office (GAO).

Without an immediate effort to fix the problem, the GAO concluded, "the department's year 2000 efforts will be at risk of failure."

In its formal response to the report, the Defense Department agreed its inventory system needs improvement and said it has instituted a validation and data-quality program for the software.

At issue is the Defense Integration Support Tools (DIST) system, which is used to inventory all computer systems throughout the U.S. military. Users told GAO investigators that DIST "is an antiquated and labor-intensive system" that contains duplicate, inaccurate and incomplete entries. As a result, some frustrated information systems personnel have stopped using it altogether.

The GAO contends that a complete systems inventory is essential for accurate assessment of the year 2000 problem. Also, lack of a cross-agency database will hinder decision-making about costs and expected time frames, according to the GAO.

Although some of the armed services can turn to their own databases and tracking techniques, the Navy had been counting on DIST for its year 2000 assessment phase.

The Defense Information Systems Agency has acknowledged DIST isn't working as well as it needs to. The agency said it has been working since last fall to boost the accuracy and usefulness of the tool. New releases of DIST are scheduled for next month and October. □

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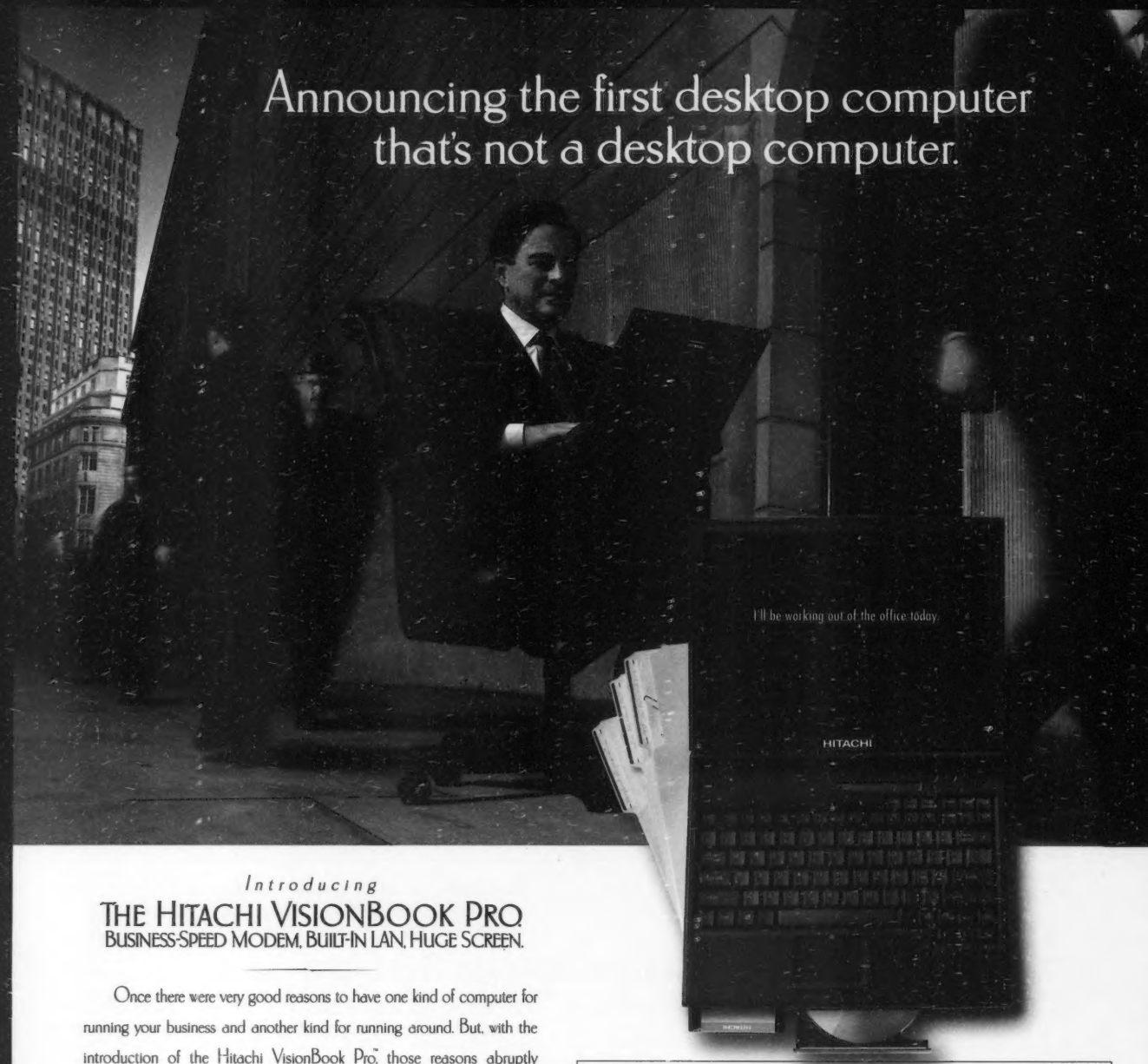

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*Concurrent use of floppy and CD ROM drives requires use of external AC adapter. **All x2 products are capable of 56Kbps downloads; however, due to FCC regulations which restrict power output, current download speeds are limited to 53Kbps. Model shown is 7560 and specs quoted apply to that model. Specifications and availability subject to change without notice.

CW 0818

COMMENTARY

Memo to Jobs: Take foot off neck of cloners

David Coursey

I swore I wouldn't write another Apple column. But that picture of Steve Jobs on the cover of *Time* last week — telling Bill Gates that Microsoft's investment in Apple makes the world a better place — was more than I could bear.

Although I agree with Jobs that a world with Apple is better than one without, the idea of Jobs — who apparently sold his own Apple shares about the same time he was axing Gil Amelio — thanking Gates for buying in is, well, "retch, barf!" as one co-worker described it.

Jobs' plan to save Apple appears deeply rooted in dragging the company back to the time of his ouster — more than a decade ago — and starting over from that point. It may be an interesting exercise to *ponder* such things, but Jobs seems intent on forcing us to *relive* them. Perhaps then we'll appreciate what a smart guy he is and forget the debacle of the Next hardware platform. Not likely.

In his quest to recapture those thrilling days of yesteryear, Jobs has hired back the creative but ineffectual advertising agency he once worked with. More troublesome, Jobs now seems to be trying to force the cloners — Round Rock, Texas-based Power Computing especially — out of the Macintosh business.

As Power Computing takes market share from Apple (it's funny how better, less expensive boxes will do that, isn't it?), Jobs seems to be telling customers that the industry isn't big enough for both companies and that he's got the clout to solve the problem.

This from the guy who apparently sold all but one of his Apple shares in June because he didn't have faith that Apple management could turn things around. Apple management turns out to be him. For me, that killed Jobs' credibility, so I shouldn't be surprised that he's now working to kill Apple's credibility.

What about the people who bought Power Computing's Mac OS machines based on what seemed like Apple's commitment to broaden support for the platform by licensing it? What about the notion that a competitive market is an efficient market? And that customers are well-served by the price competition that results from second-sourcing? I don't remember the part where Apple said it would pull the rug out if cloners did too well (or if Apple did too poorly).

That's especially sad because Power Computing has built low- and high-end machines that meet market demand and force Apple to do better. It's no accident that Apple's product line today is arguably the best it's ever been. And the fastest I've ever seen Word or Excel run — on any platform — is on the new 275-MHz Macintosh from Power Computing. That competition is the only thing that keeps Mac OS machines even vaguely price competitive with Intel boxes, and Power Computing gets most of the credit.

If that's what Jobs is trying to put an end to — and people such as Power Computing President Joel Kocher say he is — then Apple will never return to health.

Good thing, then, that Kocher's company is building a new line of Intel-based machines as quickly as possible. Then, like every other Macintosh vendor — hardware and software both — Power Computing will slide out of the Macintosh market for the greener Wintel pastures.

What would really make the world a better place would be for Jobs to pick up the telephone and call Power Computing and order a few machines. And then promise the company and other cloners fair licensing terms. A healthy market requires more than one participant. □

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Steve's Job: A Toy Story

David Moschella

Let's see. Microsoft gets relief from a long-standing user interface patent dispute, additional armor to fend off any government antitrust suit, a key ally in its all-out battle with Netscape and Java and a wave of favorable publicity for so benevolently "helping out" its one-time rival.

Apple gets Microsoft to agree to keep developing the software it has built into a business worth several hundred million dollars. Microsoft also agrees not to sell its new Apple shares for all of three years. So for that brief period, a small part of Microsoft actually hopes Apple prospers. Wow, what a great deal Steve Jobs just negotiated.

Of course, what Apple really got for all of its groveling was a giant red herring, a piece of glitzy news to take people's minds off the fact that it still doesn't have a CEO, that its licensing strategy is in disarray and that the overall Macintosh platform is still spiraling downward. Also, the deal was the perfect backdrop for the latest episode of the Steve Jobs' will-he-or-won't-he Hamlet act, one of the longest running teases since Mario Cuomo.

Can anyone recall a case in which a company's decision-making has been so completely hijacked by someone who is essentially serving as a management consultant, cheerleader and executive recruiter? This is business as a toy store, a chance to play out all of your strategic fantasies without assuming any real responsibility. At least President Clinton didn't let Dick Morris be seen with his hands on the wheel.

But with the old Apple board on the way out and the new one just being sworn in, Jobs seized the initiative.

Clearly, the first act of Apple's new all-star board should be to tell Steve that unless and until he is made CEO, he can give all the advice he wants, but strategic decisions of that magnitude should wait until a real management team is in place. Attracting a proven, highly visible CEO wasn't going to be easy, but the task is now doubly difficult given that so much of the company's future has just been determined.

Can anyone recall a case in which a company's decision-making has been so completely hijacked by someone who is essentially a consultant?

By deferring to Microsoft's browser and Java strategies, Apple has compromised the independent software elegance that formed the very soul of its brand. It also has turned its back on old friends Netscape and Sun, and making future network computer cooperation with Oracle much more difficult. (I wonder what new board member Larry Ellison really thinks about his friend Steve's latest adventure.) Not surprisingly, many in the Macintosh community are deeply disappointed.

I'm not sure which is worse — what was done or the way it was done. Apple has a long history of seeing itself as different. In this case, the difference is its total defiance of standard business operating procedures. In the real world, authority and responsibility come together. But apparently, Steve's job is all authority with the responsibility left to others — unless, of course, he actually becomes Apple's next CEO. □

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The Back Page

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Dispatches & images from the fringes of the electronic frontier

Usenet forums

The following are recent Usenet newsgroup discussion threads found on the Internet. You may be able to pick up the thread by entering keywords at the search engine www.dejanews.com.

- Using intranets for knowledge management (comp.infosystems.intranet)
- Will Informix survive? (comp.databases.informix)
- OpenVMS Frequently Asked Questions (comp.sys.dec)
- Is it possible to deliver error-free software? (comp.software-eng)
- Can a client/server application be converted to a Web application automatically? (comp.client-server)
- Skimming through electronic texts (comp.human-factors)
- Building an intranet with AS/400 (comp.sys.ibm.as400.misc)

DOTTING I'S, CROSSING T'S

Sure, the job applicant has a great resume. But have you checked the personality traits revealed by his handwriting? A leading graphologist has embedded her expertise in PC software called Sheila Lowe's Handwriting Analyzer, which produces a personality profile of job applicants, family members or even criminal suspects. The $395 Windows package can be downloaded from the Internet at *www.writinganalysis.com*.

ERIC YANG

Spreadsheet Hall of Shame

A visit to the Spreadsheet Research Web site (***www.cba.hawaii.edu/panko/ssr/***) is a chilling experience. The collection of studies shows that spreadsheet users make errors at rates that are "deeply disturbing," says Professor Raymond R. Panko.

Honey, I shrunk the lab

Researchers at Purdue University in West Lafayette, Ind., have developed a way to shrink the machines used in chemistry laboratories and place them on a single silicon chip. "We now have the ability to do chemistry on a chip and carry out large numbers of experiments at the same time," says researcher Fred Regnier (right). The chips may be available in three to five years.

Inside Lines

Stop. Please stop!

We could deal with "intranet" and "extranet." The mad penchant to jam "cyber" on the front end of words such as "space" and "sex" was annoying, but OK. Last week, though, the inanity went too far when an Illinois market research firm told us it actually had trademarked the term "focasting." That's for "focused broadcasting," which is a vague notion that push and pull information models can combine to make the world a better place. We say, let's call a moratorium on faux (and "fo") words right this cyberinstant.

Write joke once, tell anywhere

Rephrasing the Java mantra — "write once, run anywhere" — has become good sport the past few months. Microsoft's take: "Write once, test everywhere." But, speaking at the Windows NT Intranet Solutions show in San Francisco last week, Mitchell Kertzman, chairman and CEO of Sybase, offered this observation on Microsoft's view: "Write once, run anywhere — but why would you want to run anywhere but Windows?"

Not a good sign

Executives at the new Bell Atlantic, the result of a merger of Bell Atlantic and Nynex, held a teleconference Friday morning in New York, with press calling in from around the nation. Well, what do you know? Telephone operators had to repeatedly apologize for poor-quality connections, which made it difficult for reporters outside New York to hear or ask questions.

Worf, Mars, Bullwinkle and more

A survey of systems managers who run monitoring software from Concord Communications revealed that many named their servers after science fiction characters, celestial objects and cartoon characters. But several servers had unique functional names, such as tonsil (an image server that swells up at night), terrine (it runs a soup of applications) and skimmer (its tax calculations skim off money for the government).

No honor among hackers

A hacker site outlining products used to steal satellite television signals, *www.hackerscatalog.com/dssfaq1.htm*, warns buyers about getting ripped off. For example, battery card kits that sell for $250 are unlikely to be legitimate when the street price for such smart-card emulators that work is $650 or more. Warns the anonymous hacker to his would-be colleagues in crime: "There are a lot of thieves out there."

Star Trek 101

During his keynote speech at last week's Share technical conference in Atlanta, IBM/Lotus consultant John Landry likened Microsoft's efforts to take over Java technology to the Klingons in *Star Trek* and compared the efforts of IBM, Sun and other vendors to the Federation. The only problem: In recent series, the Klingons have been allied with the Federation. Some said a more appropriate Microsoft comparison would be the Federation's new enemy — the Borg — whose motto is "Resistance is futile; you will be assimilated."

Pardon us for our ignorance. But exactly when did Digital become a mainframe company? We thought the company made a living — or what passes for it these days — selling minicomputers, Alpha servers, microprocessors, chips, storage equipment, et al. But not one mainframe. Try telling that to the Wall Street Journal Interactive, *the online version of the newspaper. In a story on Digital last week, it referred to the company as a "struggling mainframe giant" and later as the "once-dominant mainframe computer company." Hmm! Maybe Digital's stealth marketing is to blame. If you have any information to pass along, check first for accuracy, then contact news editor Patricia Keefe at (508) 820-8183 or patricia_keefe@cw.com.*

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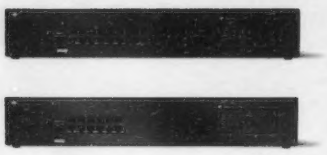

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